ADAM NEWS NETWORK Presents:

The Official ADAM Survival Guide

ADAM™

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INTRODUCTION TO ASG

What you hold in your hand is the culmination of months of hard, (yet satisfying), work.

The ASG editors, chapter authors, and chapter author/editors hereof have given freely of their time so that you, the reader, could benefit.

Barry Wilson, the principal in the efforts to bring this book to you, had some years ago conceived the idea of an ADAM News Network. This was to be a monthly mailing to subscribers of disks containing many articles and programs. This idea was conceived with the notion of spreading AS MUCH INFORMATION TO AS MANY ADAM USERS as possible.

Barry can't stand to see an idea sit idle, and so he was driven to push this information out to those who needed it most, and to collar a few volunteers along the way. As a result of the work of Barry and this team of volunteers, today ANN is recognized by many newsletters and bulletin boards as an excellent source of ADAM material and information.

But Barry wasn't satisfied to stop with the success of the ANN project. In the middle of 1990, he had another dream. He wanted to publish something parallel to, but more valuable to the ADAM user, than the "ADAM RESOURCE DIRECTORY", which was printed in 1986. He had found this directory to be a tremendous help in his early days with ADAM, and wanted such a publication to be continued, and to be updated and published on a periodic basis, perhaps every two or three years.

That was the beginning of what has eventually brought this book to be in your hands. Barry marshalled his ANN staff and after several months of discussion, decided to proceed with the project.

However, Barry is a practicing attorney, (and not a rich one as ownership of the ADAM and involvement in its promotion will attest), and is trying to put a daughter through college; and it wasn't long before Barry recognized that he was taking on a little too much to handle by himself in editing, directing and over-seeing the whole project. That was when he got in touch with Mel Ostler.

Mel, having worked many years as a scientist, and having published several scientific papers in that capacity; as well as having written four ADAM books; in addition to having had his own printing business at one time: had no illusions about the amount of time that this would require. But he, like Barry, wanted to produce a work that would encourage ADAM owners to keep and use, in increasing capacities, their ADAM computers. And therefore Mel joined Barry as Co-Editor of the ASG.

Barry and Mel worked in close harmony getting Barry's original list of writers involved, and getting the final chapters organized; and making changes thereunto as need demanded: and generally assuring that quality was held to a high standard, and that all deadlines were met.

The cooperation which existed between these two ADAMites, was professional, and completely non-competitive, and although Mel may have done most of the actual editing, Barry spent many hours doing what he does best, keeping the lines of communication open. Barry sent a never ending stream of letters, (doing his part to help the US Postal Service balance its budget); he nagged; he pleaded; he coaxed; he joked; he prodded and he pushed and he pulled; in general keeping the organization coherent.

It has been a very time consuming job for both men, and they both deeply appreciate the help that the other has given.

Much thanks go out to both Barry and Mel for their joint efforts, each in his own field of strength, and each according to the time he had to impart to this very worthy project.

And not to be forgotten nor minimized in the handing out of honors, are the Authors and Editor/Authors of the individual chapters. Their work has been superb. The level of information, as well as the professional manner in which they have worked with the ASG editors; coupled with the great amount of time and postage and media expenses given for this work by many of them; cannot be ignored. The reader may but review any chapter and recognize these obvious facts.

These Authors and Editor/Authors, come from all walks of life. There are school teachers, lawyers and scientists. There are librarians, engineers, paper hangers and "Mr. Moms". There are some who are retired, and others who are still raising families. And there are combinations of all, some of, and none of the above.

Some are renowned names in the ADAM community, and of some, you may have never heard mention before.

Some are quite expert in one or several areas of ADAM work. Some are not, but write here nevertheless, to show you how THEY go about using their ADAMs.

They all have one thing in common though. They are eager to share their knowledge, (and time), with others.

And we thank them for those efforts.

With all of the personal sacrifice required by each one involved in the "doing" part of the creation of the ASG two of the unstated purposes of the ASG were shown to be undeniably true. While the stated purpose of ASG was to enhance communication among ADAMites and make available basic information about the computer as well as to let them know where more advanced information could be obtained so as to keep ADAMites with ADAM; there were also two unstated purposes.

The most significant of the unstated purposes for the creation of the ASG was to demonstrate that when ADAMites from all over North America work together on a common project, (in this case the ASG), great things can be accomplished; and that when ADAMites work together on common ADAM projects, nothing need be beyond their reach.

The second of the two unstated purposes has been demonstrated by the great increase in communication and interaction that has been accomplished as ADAMites worked together on this common ADAM project. The success of the production of the ASG has brought an interaction between ADAM experts and ADAM activists, most of whom we NOW KNOW but some of whom we KNEW NOT. This interaction broadens the support base for ADAM so that the possible loss of no one ADAMite is not so likely to cause a significant loss to the ADAM community as a whole.

It is our sincere hope that you find this book useful. While it is intended for the isolated and beginning ADAM user, it does have many very useful tidbits for the advanced user as well.

Whatever your level of usage, may this book be your guide through the world of ADAM!

Bart Lynch

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IMPORTANT NAMES AND ADDRESSES

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ADAMzap Software	Eric Danz			
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Computer Buyers Guide				
POBX 55886	Birmingham	AL	USA	35255
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Ellian Associates	Bill Koch			
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HEXACE Software	Bruce Walters			
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Hinkle Publications	Ben Hinkle			
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Kosowsky Adam Repair	Phil Kosowsky			
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L.O.P. Communications	Charlie Summers			
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MIAD	Lyle Marschand			
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Oasis Pensive Abacutors	Gary Bowser			
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Oscars Computers	Howard Pines			
224 F. Elgin Prkwy.	Ft. Walton Beach	FL	USA	32548
Practical Programs				
4318 Monroe Ave.	Kalamazoo	MI	USA	49002
Reedy Software	Jack Reedy			
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Roadrunner Publications	Mel Ostler			
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R&R Software	Rich Salvati			
POBX 2081	Hanover	MA	USA	02339
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(Refer to TELECOMMUNICATIONS/BBS chapter for details)

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Adam Connection	Steve Major	(518) 298-4294
Adam Exchange	George Kocwara	(216) 883-9355
AWAUG	Jeff Jodoin	(202) 561-2475
Cat's Lair	Peter Ames	(802) 295-2550
Coleco Depot	Darryl Quinn	(718) 848-3066
EAUG	Larry Overman	(714) 775-1683
Mach I	Gary Schoenung	(414) 762-0492
Maine	Robert Sebelist	(207) 583-4923
Mon-Beau-ADAM		(514) 474-3756
Midas Touch	Dale Malone	(407) 648-1133
Micro Innovations	Mark Gordon	(703) 264-3988
Northern Link	Gerry St Peter	(403) 246-4046
Rocky Mountain BBS		(719) 783-9046
St.Louis	Al Fitzgerald	(314) 383-3617
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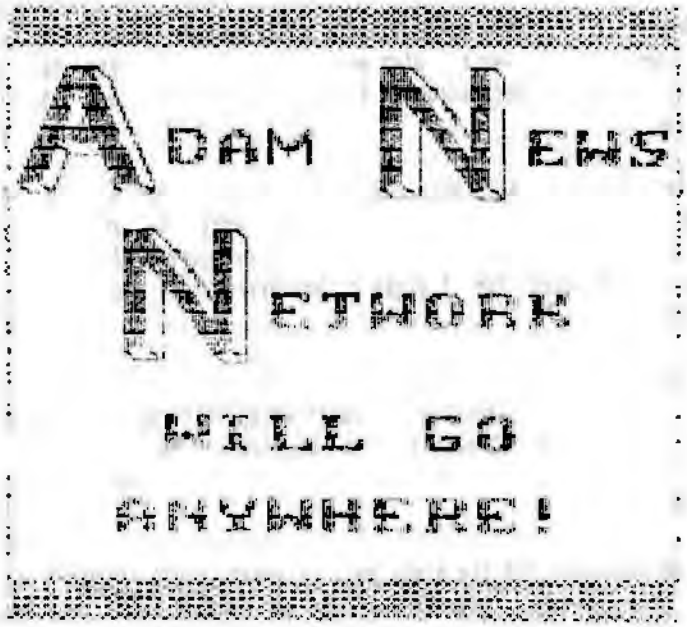
Tony Patterson	7125 Dewberry St.	Ocean Springs	MS 39564
Carol Tapia	3714 Sequin	Dallas	TX 75220
Jerry Vranchs	2936 Evelyn St	Portage	IN 46368



ANN - ITS HISTORY AND PROJECTS

ORIGIN OF A NETWORK, by Dean Roades - Associate Editor of A.N.N.

In a small log cabin, on the eastern edge of Missouri, a young boy sat sleepily by the fireplace, reviewing the happenings .... (No, that was much to long ago.)

It was a small 5,000 watt radio station in St. Louis. Lightening was playing a fierce game in the cloudy sky of the dark night outside. While inside, in the warm but dimly lit studio, the 5th Beatle was just ..... (That's still not right!)

I guess that I'd better stick right to the subject!

Barry Wilson of the St. Louis ADAM User Group founded the ADAM News Network (ANN) in an effort to make more ADAM information available to ADAM newsletter editors and Bulletin Boards.

He sent the first disk out in June of 1989. That first disk was a collection of articles, mostly written by Barry, and reached 8 or 10 people.

In August of '89 Barry established a distribution chain where each person receiving the disk would mail 1 or 2 copies to other editors. This expanded the distribution to about 15 receivers.

The September '89 disks were the first to use the "ADAM News Network" title. By this time Barry was collecting information from BBSs, newsletters, the very successful result of which created the need for 2 disks to be distributed to each recipient.

In October '89, Barry added a 'READMETWO' file to each disk. This was a sort of "article abstract" file, (it contained a short description of each file on the disk). This was a great help to all who used the disks. Total distribution was 31 that month.

Through November '89 the disks were released in the "prior" month with a request that the articles not be used until the month indicated, in order to allow the writer to use it before it became generally available. There were still two disks distrubted per recipient that month.

In December, the "release date system" was changed to have the disks released within the first few days of each month. Barry also began a standard numbering system for the disks.

8912ANN-1, 8912ANN-2 and 8912ANN-3 were the first disks in this new system. (That's right! There were 3 disks that month!) Distribution hit 49!

ANN continued to grow. Barry was swamped with the amount of information that was flowing in, so he enlisted Dean Roades of 463 ADAM User Group to help by preparing the READMETWO files. Dean was rewarded in March '90 by being named Associate Editor of ANN.

Between March and July of 1990, the ANN staff grew to include ADAMites from all over the continent:

Regional Editors-
Ron Mitchell - AUPG, Richard Clee - MYAG, David Cobley - VISA (Vancouver). Ricki Gerlach was named Graphics Editor, Bart Lynch (PSAM) - Telecommunications Editor, and Pat Herrington (HOAUG) - Contributing Editor.

By the time ADAMCON 02 rolled around, ANN was distributing disks to 52 ADAM user groups, BBSs, and suppliers. 16 individuals were receiving ANN disks on a subscription basis. ANN was also collecting information from over 18 AUGs, 10 BBSs, and 10 ADAM suppliers.

Everything seemed to be going well, but as ANN grew, growth related problems arose.

The distribution chain had many layers and occasionaly broke down. It was an all volunteer effort and most did their best to keep it up, but it became obvious in the latter half of 1990 that, if ANN was to continue, a better method of distribution would be needed.

In January, 1991, ANN converted to a subscription only basis of distribution. The cost, at $35.00/year, was approximately the same as the cost of re-mailing disks, and the distribution was designed to come from only 2 or 3 points. In this way, all subscribers would receive their disks on a timely basis.

In January of 1991, the ANN staff had grown to include:

Phil Kosowsky - Repairs and Maintainance Editor

Lani Brito (HOABG) - Contest Editor
Bob Blair (ABABG) - Regional Editor
Jerry Vranckx (463 ADAM) - Special Projects Editor
Joe Alford (463 ADAM) - Special Projects Editor

These are a lot of dedicated people who are working hard to keep ADAM the best computer around.

AMN's subscription base continued to grow. At the end of January, the first month of subscription only, distribution was 48.

Added to the AMN staff in Febreary were:

Mel Ostler - Publications Editor with special initial assignment to co-edit and co-oversee the ABG project
Bill Reynolds - Special Projects

By April of 1991, subscriptions to AMN were approaching 100.

What does the future hold? No one knows, but as long as there are ADAMites, AMN will continue to support the exchange of information between them.

ADAM NEWS NETWORK - PROJECTS

AMN is involved in many projects to help ADAM and ADAMites across the continent. Some of these projects are:

ADAM SURVIVAL GUIDE - Barry Wilson & Mel Ostler, co-editors

The first edition of the "ADAM SURVIVAL GUIDE" that you are now reading is the product of one of the most ambitious projects undertaken for ADAM. Barry conceived the idea and convinced enough ADAMites to contribute their time and energy to make it happen.

Mel Ostler joined the AMN staff to oversee and co-edit this book. The coordination of all the contributors, experts and novices alike, was a monumental task. We hope you like what you see.

This first edition of the ADAM Survival Guide is not the last one. Work has already begun on edition number 2.

The second edition will contain updates to information contained in this edition of course, but in general will develop subjects from the level herein presented, in the direction of more advanced discussions and explanations.

The second edition will likely be printed in two years. As with this edition, there will be more information, tips, tricks, and ways to get the most out of your ADAM.

ADAM EXPERT PANEL - Ron Mitchell

This is AMN's excursion into the problem solving business. Many ADAMites encounter problems, failures, glitches, and questions of one variety or another.

Frequently, when you find yourself in this situation, there's no one around to help. You may be miles away from the nearest ADAMite, or no one in your user group has the expertise to help. That's where the Expert Panel comes in.

The Expert Panel is a clearing house for information. Your questions and problems will be forwarded to an ADAM expert in that particular field for resolution. Those problems which seem to be most common, and which are of a general nature, (and their solutions), will be included in AMN information disks.

Depending upon the urgency of the problem, you may call or write.

Ron Mitchell - ADAM Expert Panel
c/o Apt. 1107, 210 Gloucester St.
Ottawa, Ontario, Canada K2P 2K4
(604) 230-9511 (answering machine set for 3 rings)

Rules of Operation For Use Of Expert Panel:

1. The panel must be user supported, (in other words we need you to help in whatever way you can). For this reason, please include a SASE (self addressed, stamped envelope) with written inquiries. Phone calls will be returned collect.
2. Please provide the following information:
   A. How old are you?
   B. How old is your ADAM?
   C. Describe your system. Is it a BASE ADAM or what hardware additions have you made?
   D. Be as specific as you can about the problem.
   - What software were you running?
   - What happened, and what did you expect to happen?
   - What possible solutions have you tried? (Describe your actions on that subject, and the results).
   - At what point in the program did you encounter the problem?

The more information you give us, the better chance we have of finding a solution for you.

Your first line of defense against problems related to ADAM, should be your local user group.

If you are unable to solve your problem there, (where it can be solved more personally, through demonstrations, etc.), we will do our best to help.

Neither ANN, nor it's officers, nor expert panelists may be held legally responsible for problems which may arise from the use or misuse of the information provided. Bear in mind, we are volunteers and we only want to help you, and we will do our best to do so.

MAIL LIST - Ron Mitchell

ANN works with many suppliers, user groups and others to compile master lists of people associated with ADAM. The purpose is to make this list available where it will benefit ADAM.

ANN recognizes that strong user groups will make well rewarded suppliers, manufacturers and programmers; and that well rewarded suppliers, manufacturers and programmers will make more and better ADAM products in hardware and software. With more and better products there will be more satisfied ADAMites; and that will make stronger user groups, etc.

Thus it is that it is in the best interest of all ADAMites to help build strong user groups.

ANN reccommends that new user groups ask for the names of ADAM owners in their area, in order to build their group. (For example, the organizers of ADAMCON 83 obtained a list of people in the Mid-West who may be able to drive to South Bend).

There are many conceivable uses for a list of his kind, but this list will be used discreetly, and expressively for the advancement of ADAM.

GALLERY OF HONOUR - Richard Clee

Our ADAM is an orphaned computer, one of the finest designs of any 8 bit computer. But, (of financial necessity but brutally), abandoned by it's maker and five generations out of date; it's insistest users, not only carry on, but go from strength to strength as time goes by.

How can this be?

It is because, users and enthusiasts have stepped in to support ADAM to such a degree that often the ADAM user has more and better support and products available to him than owners of other computers which are still on the market.

ANN believes that it is time that the ADAM community said a collective "THANK YOU" to those who have rescued ADAM from abandonment and have brought it to such robust health.

It was suggested at ADAMCON 82 that the time is long past when we should establish an ADAM Gallery of Honour. The ANN Editors were commissioned to undertake this project, under the direction of Richard Clee. The first to be honored will be presented at ADAMCON 83.

The Gallery of Honour is a continuing project. All ADAMites are encouraged to submit nominations for the Gallery. Write to Richard Clee with a short explanation of why you feel that person is qualified. We hope to induct new members to the Gallery at each ADAMCON.

CONTESTS - Lani Brito

In an effort to generate interest and increase involvement in ADAM, ANN periodically runs contests through the ANN monthly disks.

Previous contests have included 'The Ugliest Sysop' and 'Guess the Weight' and even a scavenger hunt on ADAM BBSs. Several ADAM suppliers have generously donated prizes, typically free software. All contests are planned and implemented in the spirit of promoting fun, and hopefully in a way that will encourage each participant to get to know more ADAMites.

NEW ADAM USER GROUPS - David Cobley

THE STRENGTH OF THE ADAM IS IN THE LOCAL USER GROUP. The user group gives you a place to talk with other ADAMites, share problems and solutions, and get the latest news about ADAM.

David assists new AUGs with lists of people in their area from the ANN mail list, ideas about running the group, public domain software, sources of information, and just about anything they need to support ADAM. (See his excellent chapter in this ASG).

SPECIAL INTEREST COLUMNS

Barry Wilson has convinced many ADAM experts to share their knowledge with the ADAM community through the ADAM News Network. Article, especially written for ANN, appear each month. Subjects include; telecommunications, hardware, graphics, repairs, and many others. It is part of ANN's continuing effort to support ADAM.

VOLUNTEERS

All ADAMites are welcome to participate in ANN, and are encouraged to volunteer to assist ANN in it's esdeavors.

You don't have to be an 'expert' to help, everyone can do something!.

Contact any ANN officer if you are interested in getting more out of your ADAM.

PROJECTS BEING IMPLEMENTED

The following is a list of the projects being strongly considered, or being developed:

STANDARDIZATION AND INCLUSION

The lack of detail often available to the ADAMite, in terms of allowing him the ability to know what he has to do to include some particular piece of hardware on his system, (like the components that have to be discarded, or disconnected, etc.), has been of major concern to many ADAMites.

ANN is planning on forming a group to study the problem of compatibility, and make recommendations; in an effort to encourage hardware and sotware developers alike to consider the fact that ADAMites would like to buy something, and install it. (ADAMites tend to dislike having to dis-connect item A every time they want to use item B, whatever item A and item B may be; or throw away item C for which they paid $250.00, as a trade off so that they can install item D).

This may mean that I/O port assignments will be reccommended to become standardized for different items, and that connectors may be provided so that present equipment does not have to be removed completely to install something new.

Since there are MANY possible approaches to the solution of the several problems of this nature, (and in fact all of the problems have not yet been explored); no more can be said until the committee focuses on particular problems, and finds the least disruptive and most economical solutions and corrections possible.

CONSUMER ADVOCATE, DISPUTE ARBITRATOR

Inasmuch as disputes are not pleasant to either party, and inasmuch as third parties to disputes tend to take sides; and inasmuch as the success of ADAM depends heavily upon dedicated cooperation between its users; settling disputes through arbitrative means is vital to the success of our organization. (By that is meant the whole ADAM community organization).

ANN cannot be a judge over ADAMland, but may perhaps in serious cases, upon request of at least one disputee, and after then obtaining the willing consent of the other disputee, act as a central agent to set up arbitration committees, two members of which represent the disputees, and at lest one being a mutually acceptable 3rd party committee chairman.

In addition to this, in cases which are likely to be minor misunderstandings, such as a purchaser being upset about the product purchased etc., ANN may be able to appoint an agent to represent the purchaser, and report the findings or whatever to the purchaser, and perhaps, on condition that the information be pertinent, to the whole ADAM community.

The purpose of this function would be to minimize friction in any and all sectors of the ADAM community, to the extent that the members thereof were interested in having it minimized.

USED ITEM COORDINATOR

On occasion a 4 year old boy will rip the print head cable from the print head of the Panasonic DM printer of his father. This might happen in town A.

Meanwhile in town B, another user over-taxes his Panasonic printer through his habit of writing frequent letters to all about him; and a circuit board goes out.

The user in town A now has a very handsome piece of trash, (since for a few more dollars than a new print head will cost, (if he can find one), he can buy a newer model Panasonic).

The user in town B has another very handsome piece of trash for a similar reason.

But, via mutual contact with the "USED ITEM COORDINATOR", the number of options for the two users increases.

1.Perhaps User A, (the discomfitted user in city A), would like to buy the sick machine from user B, salvage the print head, and offer the rest of the machine to the information base of the USED ITEM COORDINATOR for possible future additional salvage.

2.Perhaps User B could buy from user A for maybe half the cost of a new circuit board, and repair his printer, thus allowing user A to have a better opportunity to buy the new laser printer that he was saving for anyway.

3.Perhaps Users A and B want new units, and offer the information to the information base of the "UIC", and several days later another struggling ADAMite inquires to find that he can get the two machines inexpensively, and make a working

unit; allowing him to obtain a DN printer long before he might otherwise. He might in turn place the names of the good components remaining in the UIC information base, and wait until someone needs one of his parts.

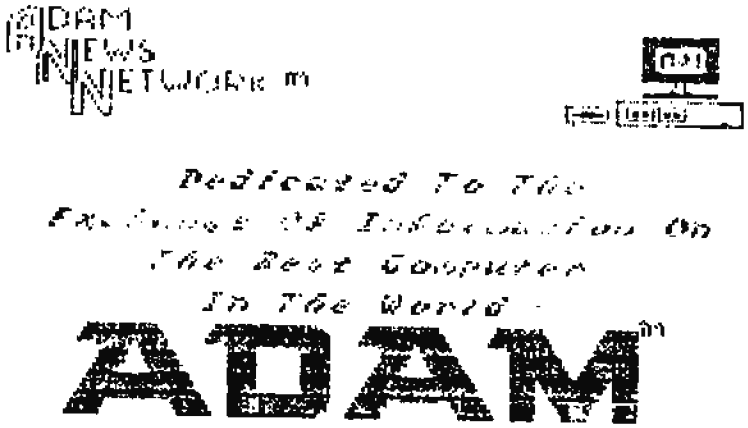
4.Maybe User A, before his printer gets ripped apart by the mean little kid, just decides that he needs a new model printer in any case, and decides to sell his used unit. The information base is updated by the UIC, and then the UIC searches for someone registered there as a potential buyer. He can then make a pre-defined offer for the unit, or at least put the parties in touch with each other.

Possible combinations of the above options are multiple, and it will befall the UIC to try to match supply with demand. Hopefully this will assist the needy in all cases, in having their needs filled.

PROJECTS NEEDED

If you can think of a project that ANN could do from the vantage point of its central position in the ADAM community; something that will build the ADAM community as a whole, get more people involved in ADAM useage, increase cooperation between ADAMites, or anything that will help ADAM users get more out of their computers, (be it work or fun), please feel free to send your ideas to the editors of ASG. (For address(es) see front section of this ASG, "IMPORTANT NAMES AND ADDRESSES").

(Ron Mitchell and Richard Clee contributed to this article).



WELCOME TO THE WORLD OF ADAM!

Edited by Tom Keene

This article, (originally by Jim Clements), was taken from the August 1990 edition of ANN, and edited for use in the ADAM Survival Guide. Jim Clements is well known to the ADAM community. He appears often on Compuserve.

Congratulations, you are using one of the finest computers of its type and price ever put on the home market.

This Survival Guide is designed with special emphasis for people who are new to the ADAM Family Computing System, but it also has much very useful and pertinent information for even the more advanced ADAM.

You will find that the ADAM computer is amazingly simple to operate and yet, because of its very sophisticated electronic design, it is versatile enough to run a wide range of the very large number of public domain and powerful commercial programs that are available to it. these programs include everything from games to home management and complicated business budgeting; and a bit of everything in between.

THE ADAM is a color computer, and yet it works almost as well with a black-and-white TV.

If you only want it for games, it's one of the best.

And do you need to do word processing?, you'll soon find that ADAM's built-in word processor and the ADAM printer that are part of the new ADAM "boodle"; are more than enough for most people.

And you will also soon find that even better programs and different printers, (and even advanced hardware), are available. (One of ADAM's programs, ADAMCalc, a "spreadsheet" program for budgets, was an award-winner)!

ADAM lets you do your own programming in "BASIC". BASIC is a very simple computer language "dialect".("BASIC" is actually a method of programming, and is by no means unique to ADAM. But the ADAM version, called SmartBASIC, is the best of it's time. It is remarkable in that it will usually tell you when you've made a mistake and give a hint how to fix it.

And ADAM is equally at home with CP/M, (or T-DOS, which is a far superior replacement to CP/M). CP/M and T-DOS are operating systems. (An "operating system is a series of small programs that tell a computer how to communicate with its attachments, like the keyboard, video screen, tape drive and disk drive, as opposed to application software which are programs which tell the operating system what to do with peripherals). Until the mid-80s CP/M was the world's most popular operating system.

There are thousands of excellent CP/M programs available, and most can be adapted for ADAM for use in business or the home.

Finally you may be surprised to learn that ADAM is still a very lively computer, considering the fact that it was "killed off" by Coleco, it's manufacturer, barely a year after it was introduced.

And yet, while it didn't really die, it is an orphan -- but one that needs, and thus far has had, a lot of support.

In fact, the very fact that you are reading this copy of ASG probably indicates that you have already found the most important source of support for ADAM; that is, you have found one of the many user groups or clubs in Canada, the U.S.A. and many other countries abroad.

(Incidentally, the compilers of the ASG are in no way connected with Coleco or any other company making or selling ADAM products; nor do they support any one particular AUG. In fact all members of ANN belong to an AUG, and very few belong to the same AUG as any other ANN member. The production of this ASG was done solely by ADAM users for the benefit of other potential ADAM users and is intended to be distributed to anyone who can use it.)

AN OVERVIEW

To get started, let me give a short overview of what you will find in this chapter.

-This article, will go on to discuss;
1.what you can -- and one thing you can't -- do with ADAM,
2.some of what software and hardware is available to you, and
3.where, and
4.how to find out more about ADAM.

(Let me digress for a moment to explain something to the really new computer users.
-"Hardware" is what you can see and touch; such things as keyboards and printers and expansion boards.
-"Software" is what you usually can't see; the computer coding located in the computer memory, and/or located on the tapes or disks. This coding is what tells the computer what to do).

Now, on to something most computer articles and courses neglect -- one thing you CAN'T do with an ADAM, (or any other computer for that matter)!

You CAN'T hurt, wreck or just-plain-ruin ADAM or any other computer by pressing the wrong button, (or even a bunch of wrong buttons), at the wrong time. You won't start World War III with a slip of your finger or find yourself talking to a CIA master computer in Foggy Bottom, VA. You're ADAM won't disappear in a burst of electric energy and explosions like computers used to do in science fiction films.

That possibility, like the films wherein such things "happen", is just fiction.

In fact, if you do make a mistake ADAM will usually tell you, (somehow), often pointing out how to correct it.

About the worst that can happen is that you will lose valuable information -- (like your 20-page letter of love to your Great, (and very rich), Aunt Agness), if you make a serious error.

BACK-UPS

Even this kind of loss, though not entirely avoidable, can be greatly minimized if you regularly follow one of the first rules of self-defense in dealing with computers -- **make back-ups and make them often.**

That is, make copies of all of the media with which you are working, both of the original programs, and of the data you generate to save.

Some of the original "ADAM programs" have ways of making copies that are built in; but for more general use, you can also obtain good public domain copy programs or purchase commercial copiers. Study this subject in some of the other chapters in this ASG, choose a copy program, make backups, and save them for emergencies!

Then if you press the wrong key -- or worse yet, if you have a power failure when you are using your computer -- you won't feel frustrated enough to wreck your ADAM for real with a fire axe. (Remember, the more often you make copies of material you are creating, the less will be lost when the power goes off).

Having said that, feel free to let your fingers fly -- the best way to learn about ADAM or any other computer is through doing, and now you can do it without worrying about destroying the world as we know it -- or your computer.

ADAM was manufactured by Coleco, the people who also gave us Cabbage Patch dolls and countless other toys. It's development grew out of their familiarity with computers which they gained as they developed the ColecoVision game system.

The ColecoVision game system was the best on the market at the time. (See the chapter THE CREATION OF ADAM for more very interesting insight into the development of the ADAM).

But don't be fooled! You don't have a Cabbage Patch computer! Unless the very most sophisticated things grow in cabbage patches these days.

THE ORIGINAL BUNDLE

ADAM was one of the first, and is still one of the finest, "bundled" computers. By "bundled", I mean that it was complete and ready to operate right out of the box. It had a keyboard; a printer; a CPU, (or central processing unit or "brain" of the computer); and a built in mass data storge drive, (the digital data drive). ADAM comes with everything you need to compute. You don't really have to buy anything else other than paper for the printer.

But like the Biblical Adam, while your ADAM has all of the essentials, they are the bare essentials. ("Fig leaves not included").

SOME ESSENTIAL EXTRAS

There are some "extras" you should consider keeping on hand.

The first is an adequate supply of digital data packs, those devices that look like -- but aren't -- audio cassette tapes. Digital data packs, or ddps, are the tapes upon which you store information. They function very much like the big spools of tape you saw in those old science fiction films. (But those big spools of tape from the science fiction movies weren't fiction!)

Ddps are basically much like audio cassettes, but there are important differences and you should not try to use ordinary audio cassettes in your ADAM. To attempt such a thing will only cause you frustration, and cost you time and money; and

may perhaps cause damage to your tape drive.

Only properly coded and "keyed" ddps will fit into the ADAM data drive. The ddps have special electronic coding on them; coding that tells ADAM where each block of information is stored on the tape, and the location of the first block or the "beginning" of the tape. (See the ASG chapter on Hardware for information on a device to convert standard cassette tapes to ddps).

You should keep several of these on hand. Exactly how many you need to keep, depends on what you intend to do with your computer. But remember all user programs need to be saved as back-ups; and those back-ups and your own work, (such as letters and lists), are stored on ddps. It's far better to have one or two too many than it is to have just one too few.

The second "extra" that you should keep on hand is a supply of printer ribbons. The number of extra ribbons that you decide to keep will depend upon how much printing you do. Probably no one should have less than one extra ribbon, so that if one expires while printing, the other can be inserted to finish the job.

ADD-ONS AND UPGRADES

There are a multitude of add-ons, (or upgrades), available.

--The first that I mention is really a "second", that is to say, I suggest that you get a second digital data drive. This device is identical to the original, and it is easily installed in the right hand "window" of the Memory Console of your ADAM.

While not absolutely essential, (and it is particularly not essential if you have more than one disk drive "add-on", which drives are next mentioned), you'll find that having two data drives is a definite advantage in terms of the time and the peace of mind that having it saves you.

A second drive saves a lot of tedious tape switching in some of the more complicated programs, and acts as a back-up should something disabling happen to your original data drive. If you have only one data drive and it dies, (and they do die from time to time!), due to wear or malfunction; you are left with an unfinshed task, and no way to save what you have done; and you have a computer that is little more than an electronic-age paper weight.

With two tape drives you can keep right on computing with hardly more than a pause for the apropriate, (or inappropriate, depending on your viewpoint on the subjects of etigoette, religion, "coothness", etc.), curses and blasphemes.

Remember too that only Coleco manufactured data drives, there is no other source. They were a very sophisticated device, and no one else has even attempted to replace their manufacture. So if you should see one it may be wise to get it quickly, you may not have the luxury of "second" thoughts!

--Coleco also manufactured a number of computer devices such as an excellent 300 Baud modem called ADAMLink and an automatic dialer for use with your phone.

Since the advent of regular phones with number memories, the auto dialer is little more than an interesting toy but the included address book program that goes with it is superior.

ADAMLink, the modem, can open the world of computing to your ADAM, from the obtaining of information on ADAM itself to personal banking, from "talking" to a friend's computer down the street to accessing massive information companies such as CompuServe Information Services, or perhaps accessing the computer at your school or office.

Like the data drives, they are no longer being made and should be on your ADAM shopping list if you don't already have one. You can't find one? Never fear, there is a way around that!

COLECO ADAM GAME ACCESSORIES

Coleco also manufactured a number of accessories for the ADAM, most of them in the games area such as:
1.a roller controller similar to those used in game arcades,
2.a Super Controller for use with certain games,
3.a steering device for driving games, and
4.an expansion module which allows you to play Atari 2600 and other game cartridges on your ADAM.

Like the data drives, they were only manufactured by Coleco, and are not being made by anyone else. Depeading upon your needs you might consider obtaining any one, or all of these items, should they become available. Because they are no longer manufactured they can sometimes be found at very reasonable prices through friends, neighborhood bulletin boards such as those at grocery or corner stores or flea markets and yard sales.

NEW ADAM HARDWARE COMPANIES

When Coleco left ADAM "abandoned in the Cabbage Patch", other manufacturers moved in to play "mother to the orphan". (That theme might make a good movie). Most, if not all, are in the list of ADAM SUPPLIERS in another chapter of this ASG) Some of these, such as Orphanware in Ohio, have been particularly

supportive of ADAM users in every way from new and innovative hardware and software to answering elementary questions about ADAM. (The same questions were asked and answered, OVER and over and *over*).

These companies and ADAM user groups are the best sources of new ADAM products. Through them you can get such items as:

--Disk drives. These were originally manufactured by Coleco but are now made and/or upgraded by others.

Disk drives offer two major advantages over the Digital Data Drive, for anyone with an ADAM; and the obtaining of such should be seriously considered.

First, a disk drive is much faster and more convenient than digital data pack (the tape) drives, so much so that it is difficult to comprehend without seeing one in action.

Second, because disk drives use inexpensive and commonly-available computer diskettes, they can ultimately save you money as the much more expensive digital data packs become more difficult to obtain. But since the advent of hardware which will convert audio cassettes to ddps, perhaps that advantage is not as valid as the first one.

The original ADAM disk drives held 160K of information. (A "K" or kilobyte is a unit of computer data storage measurement, usually more is better). Drive upgrades are also available offering 320K and 720K of information storage.

--Hard Disk Drives are also presently available, and increase data and program storage dramatically. (For comparison, the standard ADAM digital data pack holds 256K of information, the Coleco disk holds 160K, and upgrades are available to increase disk storage capacities to 720K; but the hard disk drives measure mass data storage capacities in the 30 to 40 MegaByte range!)

Hard Disk Drives are also exceptionally fast. To the new user they would seem to approach the speed of access from RAM itself in some situations.

CAUTION: You can only use disk drives and hard disk drives which are designed to interface with the ADAM. That is to say, you cannot use an Apple, Commodore or other disk drive by simply "plugging it in". It must be configured to interface with the ADAM.

Disk Drives, Disk Drive Conversions, and Hard Disk Drives are available from several sources, and are discusssed in more detail in the chapter on ADAM HARDWARE.

But please be advised that disk drives, like many other available ADAM add-ons, are likely to cost you as much -- or more -- than your entire ADAM Family Computer System cost you when you bought it new. HOWEVER, this need not be a major concern, inasmuch as most of us obtained the entire new ADAM "bundle" for less than $200.00, and that was for a terrific computer that well deserves to be upgraded.

It would take a lot of add-ons to bring the price up to the quality of computer system that we have.

--Memory expanders "expand" the computer's memory; that is, they allow it to use longer programs and do certain other functions, such as offering quicker access to stored programs. They are available in 64K, 256K, 512K, and 1MEG capacities, (again more is better). Although they are not essential generally, they are required if you intend to do serious computing with your ADAM. They are discussed more fully in the chapter on ADAM HARDWARE.

--1200 and 2400 Baud modems are connected internally or externally, and are generally far more complicated and somewhat more expensive than the internal ADAMLink modem. But they are also much faster.

They are well worth keeping in mind in case you cannot find an ADAMLink with which to begin your telecommunications experience. Or you may find that you have already caught the highly infectuous and always fatal "TELECOM-ITOUS", and that the only cure is to have a modem at any cost or inconvenience. The added expense is more than compensated by the added speed of the device, (which saves money in long distance charges), and by the added features which immediately relieve the symptoms of "AdamLINK frustation".

Again, see the Ron Collin's chapter on ADAM HARDWARE, but see also the chapter by Bart Lynch on TELECOMMUNICATIONS.

--Dot matrix printers can replace or augment your ADAM printer. The ADAM printer is a letter quality daisy wheel printer. That is, it produces print identical to a good electric typewriter.

However it is noisy and it is slow. It is also severely limited in terms of producing graphics.

Dot matrix printers use tiny pins to create letters and graphics. At their very best they offer only "Near Letter Quality", (NLQ), printing, (which really looks quite good). But they are very much faster and much much quieter than the ADAM printer. And they can print graphics -- everything from detailed pictures to different type sizes and fonts.

They can also handle fan-fold or "computer paper" better than the ADAM printer. In fact, they were designed around the idea of continuous feed fan-fold paper. Most, but not all, dot matrix printers can be used with ADAM. All need a special

electronic interface board before they can be operated by the ADAM. These interface boards are available to ADAM users, as noted in the chapter on ADAM HARDWARE.

When making a DK printer conversion, however, one needs to solve a small problem of maintaining ADAM power requirements.

The problem lies in the fact that the power supply for the ADAM computer is located inside of the printer housing which means you must still have the ADAM printer or some other power source such as a surplus power supply to operate ADAM when you add the dot matrix printer.

Most interface manufacturers have already provided at least one solution to this potential difficulty, so the problem is really solved before most of us even think of it.

For most novices, the ADAM printer is a perfect place to start. In fact some professional writers still prefer their standard ADAM word processor and printer to much more expensive and enhanced machines. Still other ADAM users keep both printers connected, and address either one as desired according to what the particular software they are using permits or requires, and/or according to the kind of output they desire.

--There are other devices, gadgets and goodies available for the ADAM and more becoming available every day. There is MegaCopy, (referenced above), which allows you to make your own digital data packs, there are 80 Column Video Unit boards which let you use more professional word-processing programs, speech synthesizers, MIDI interfaces, and more. In fact there is much more.

ADAM may be an orphan, but he's a well-endowed one.

--And he's well cared for. In addition to the companies and listed in the chapter on SUPPLIERS, there are a large number of ADAM user groups, (AUGs), in the United States and Canada and abroad.

If by chance you are reading this ASG and haven't found an AUG in your area, or haven't found one that is doing the things that interest you, you can start your hunting in local computer stores. They may know of one. (So might your library, which is also a good source for books on BASIC, CP/M, and out-of-print books and manuals written specifically for ADAM).

Neighborhood bulletin boards are good sources of information. If you don't see a note about an ADAM club, put one up asking if there is one. You might even consider forming a club of your own if you find there is none but there are other ADAM owners in your area. (See the Chapter by Rich Clee on starting new AUGs).

And there are very exceptional established regional clubs which you can join by mail, which will keep you informed of the latest in ADAM advances.

Probably the best place to begin looking is with ANN, the producer of this ASG. ANN keeps a list of active AUGs, and is anxious to connect users to User Groups. ANN recognizes that healthy user groups are the key to ADAM survival and continued growth. Contact an ANN member listed in the chapter IMPORTANT NAMES AND ADDRESSES for more information on AUGs, and see the list of AUGs at the end of the chapter by Rich Clee mentioned in the second paragraph above.

Remember that ANN may not have a complete list, because we depend upon the user groups to keep us informed. But we try!

ADAM INFORMATION SOURCES

--Of the information sources available, ANN is the best for current events, developments, and help; and libraries are good for general ADAM and program information.

--Another excellent source of ADAM information is CompuServe Information Services, for which you need a modem -- or a friend with a modem who also subscribes to CompuServe.

CompuServe is a massive information service in Ohio which has a special section devoted to ADAM users. As you might expect, it is one of the most active of the forums for orphaned computers. It is used regularly and you can get almost any information and personalized help there quickly. You can as well obtain the latest gossip about "our" ADAM.

Compuserve also has two "data libraries" brimming with programs for ADAM; one in BASIC and the second in CP/M. It is a valuable source of free programs, all are public domain.

--AUGs are the very "meat and potatoes" for the ADAM user. They combine the resources of all of the above mentioned information sources and provide them to their members, as the members express their needs.

Use your AUG, and don't feel shy! Many ADAM users are "born teachers", just sitting in the meetings awaiting an opportunity to help someone with a problem. Some of these people are very advanced in their understanding of ADAM, but at the same time very capable and eager to teach according to the level of the seeker of knowledge.

--Past sources of help, (which help is still available, largely in printed form), are shown appreciation via these two final thoughts.

Perhaps it is because ADAM is an orphaned computer that you

will find many ADAM users happy to help you with your problems, or who may be able to give you programs or advice.

And two companies, Orphanware and Digital Express have been extremely generous in their support of ADAM.

-Orphanware has devoted a great deal of time and effort in assisting ADAM users, as well as in the development of new ADAM products.

OrphanWare is now no longer in business, the legendary Big John Lingrel has left ADAM, (but has kept his foot in the door, just ever so little, and we hope that he will be back).

But there is a great deal of their information in print, that has been provided by them for the ADAM user. Most of it is found in old newsletters, the obtaining of which may be facilitated through your AUG.

-Digital Express offers a superior newsletter and has donated some exceptional software free to all ADAM users.

(Digital Express has gone through reorganizations and is now known as Phoenix 2000--Sol Swift is the master programmer thereof.

Although, again, the compilers of this package have no connection with either company -- or any other mentioned in this Survival Guide, -- other than as customers; the great contributions made by these two companies to the ADAM community is such that they deserve special mention.

We sincerely hope that this ADAM SURVIVAL GUIDE will be of some help to new ADAM owners, as well as to those who are more advanced in their association therewith. We also hope that others will perhaps update, correct or augment it in the future via communications to AMN, and perhaps as future ASG contributors.

Please feel free to pass this copy of the ASG along to a friend or make it available to others. But please also remember that this ASG is COPYWRITED! The work that went into this book was donated to the ADAM community. It was not intended that anyone should profit from it -- other than ADAM owners.

(Note also that some articles are individually copywrited by their authors, (although notation may not be made of such fact in the arti · itself), and all such articles are printed herein with their permission).

Cheers from Canada!
Jim Clements

NOSTALGI - A - DAM

by Tom Keene

I wonder what ever became of...

Recently I ran across an article that was talking about the early days of the ADAM. In retrospect, it is truly remarkable how enthusiastically the ADAM was received. And how terribly Coleco botched the marketing of this great machine. Many of us have heard of the horror stories coocerning the first production ADAMs. Let me quote to you an excerpt from the July 1985 Coleco ADAM Users Group newsletter:

"A while ago I talked with Joseph Sheppard and this is what he had to say:

CAUG: Would you still buy an ADAM today?

JS: Yes, I would. I still feel, (regardless of what Coleco has done), that the ADAM, right out of the box, is the best computer for the money. My expanded ADAM, (two tape and two disk drives), with all the Coleco and third party software that I have, is, in my opinion, more than enough computer for me and most people.

In fact, I was at Honeywell the other day and the technician told me that the ADAM outperforms the Apple, in benchmark tests, for speed and accuracy in computing.

CAUG: Did your ADAM work when you bought it?

JS: I was one of the first consumers in Southern California to get an ADAM in December '83. Of course, at this early date, virtually none of the ADAMs being sold worked and mine was no exception.

I returned my ADAM FIVE times to TOYS-R-US. The fifth didn't work and they were all out of stock, so I shipped it back to Coleco, (before Honeywell was contracted to do warrantee work). Two months later I received my 6th ADAM from Coleco and it didn't work either. By this time TOYS-R-US had some in stock so I got my seventh which also didn't work.

I read that Honeywell was then fixing them, so I took it to them and they replaced it with the eighth one, (It worked!), which I am still using now. But the truth is, I'm very glad that I stuck with ADAM!"

There were a lot of similar experiences by owners of the first ADAMs.

A lot of people point to the bad review that Consumer Reports gave the ADAM as being its death knell. But recently I re-read that report and althopug it did have reservations about its poor reliability, it also made the ADAM appear to be the best computer yet developed (which, of course, it was).

I never experienced any of those problems that gave the ADAM such a bad reputation. On the contrary, I have found it to be OUTSTANDINGLY reliable. I have never owned any piece of equipment whether an automobile, VCR, TV, Hi-Fi, or another computer that has even come close to the reliability I have experienced with my ADAM.

There is no question about it, though, Coleco made a big mistake by marketing it before it was ready. But the pressure of the enthusiasm of early ADAM computer hopefuls, (and perhaps the pressure of Coleco's financial backers), was apparently more than they could resist.

And the enthusiasm of these early ADAM owners was something to behold! They wanted so badly, to get user groups going.

From personal experience, I know that our IRAUG wasn't born over-night. There were many private meetings in various homes. They really wanted to get going, but friction and the inability to organize, plagued it for months. Many prominent ADAM users attended those meetings.

Harvey Klein and Mike and Paula Smith aggressively tried to get the group off of dead center.

Bill Fee hosted one group which included Taylor Barcroft and Mike and Paula Smith and Brian Stranahan.

Several times, it looked as though a cohesive group would emerge.

-Barcroft, who had highly commercial ideas about the ADAM market, moved off on his own and started putting ads in magazines for his ADAM Users of America. He advertised his newsletter which turned out to be that disapointing "GARDEN of ADAM".

Don't get me wrong. That was a real slick newsletter! Probably it was the most totally professional newsletter ever put out by anyone. It was truly outstanding. But the disappointment was in that there was never a second issue. I rather treasure my copy of that newsletter. It not only looked good, it WAS good.

Wayne Motel was one of the contributors. It came out in October 1984. Taylor got his newsletter out ahead of nearly every other AUG newsletter.

-That same month we saw another commercial national ADAM users group begin publication. It was the SPRITE CHASER put out by the No.1 ADAM Users Group of Cherry Hill New Jersey. The president was Jay H. Forman, and it appeared to be affiliated with the M.W. Ruth Company, although I don't know that for certain. It was a fairly good newsletter but not as good as many others of the months that followed.

(Editor's Note: M.W.Ruth, is thought by some to be an abreviation for "My Wife Ruth", "Ruth" being the name of the wife of Jay. Ruth seems to have run the M.W.Ruth operation quite successfully until it failed to make royalty payments to authors and manufacturers of some of their products).

-The ADAMLAND NEWS of the International ADAM Users Group, located in Lander Wyoming and run by Buck A. Rogers, came out just one month after the Sprite Chaser .

Buck Roger's newsletter was not a fly-by-night operation and, although it was not as "slick" as GARDEN of ADAM, it was a superior newsletter in every respect. Very few newsletters since have matched it for technical excellence.

There has been much said about the incredible claims that Rogers made for the equipment he was developing. But according to some people who actually saw his stuff, he wasn't kidding. That hardware was so outrageously advanced, that to this day, nobody has proposed anything half so fantastic.

All I can say is that if his hardware was as good as his newsletters, then it must have been terrific!

-The Nevada ADAM Users Group headed by Al Roginski was formed that month; but I have never seen a newsletter from them. (I'll have to ask Al about that, since he is a member of our IRAUG).

-Another newsletter, (also commercial), hit the ADAM community in December 1984. It was also highly acclaimed, and a very professional newsletter. I speak hereby of Al Gerson's AUGMENT, the official newsletter of The ADAM Users Group, Inc.

Like Taylor Marcroft's users group, it was heavily advertised and totally commercial; but unlike Marcroft's club, ADAM Users Group Inc. was not a ripoff. It was published in Lynbrook, N.Y..

(None of these newsletters are in publication today).

In January of 1985, four newsletters made their entry into the field. Three of these are still in publication.

-One that survived, MIAD, was a commercial venture that had no local membership and held no meetings.

(MIAD, founded by Lyle Marschand in the Chicago area, still flourishes. It is heavily committed to marketing hardware and software, and is not a user group in the usual sense).

-Another survivor is that very fine group in Houston, known as the Greater Houston Area ADAM Users Group, (GHAAUG), under Terry Fowler and Tom Ratan.

-The third, still existing, club that began publishing a newsletter in January of 1985, was our own IRAUG. It was never a commercial enterprise and has never failed to hold a monthly meeting since that first meeting in 1985.

-Also begun that January was the ADAM-I-Change in Wolcott N.Y., first headed by Wade Rowley and later by Robert Wright. As far as I can determine, theirs was a fairly short existence.

-The following month, February 1985, the Puget Sound ADAM Network published its first newsletter. They were merged from two previously established groups.

-The Seattle-Tacoma ADAM Users Group, headed by Barbara Duncan and the Northwest ADAM Users Group headed by Valerie Zimmerman predated the Puget Sound ADAM Network. When the Puget Sound club published their first newsletter, Barbara Duncan and Valerie Zimmerman appeared to be co-authors.

In February 1985, the ADAM Users Group of San Diego County also put out their first newsletter. This group was directed by the efforts of Sue and Bill Askew. The group is no longer in existence.

It was largely held together by Larry Overman who lived in Fountain Valley, California and drove almost two hundred miles to each meeting. It finally disbanded last year with many of its members joining the IRAUG.

Strangely, Larry joined the San Diego club because he wasn't aware that there were any ADAM groups in this area. Actually, at the time, there was another very active ADAM group in this area, (besides IRAUG), and that was AUSOCAL --ADAM Users of

Southern California.

-One of the all-time best technical newsletters began its short life in February of 1985. That was the bi-monthly ADAM Technical Journal of Milwaukee, Wisconsin. I never knew what happened to them. The publisher was Serendipity Productions and no names were ever listed in their newsletters. It did not appear that it was a users group and no mention was ever made about meetings. But what a newsletter!! Far and away the best I have ever read.

-In May 1985, The ADAM Users of Southern California (AUSOCAL) published their first newsletter. The principal writers were the founder, Harvey Klein; and Paul Schector. This group drew its support from the Los Angeles and San Fernando Valley regions.

The group was comprised of a highly technically oriented membership. They maintained a close liaison with the Inland Empire ADAM Users Group.

Harvey, who was the spartplug of AUSOCAL, was burning the candle at both ends. He was working on his thesis for an advanced degree which would be more than enough for most people. His wife who helped type his manuscripts, was suddenly stricken with a terminal illness and died very quickly. Understandably, Harvey couldn't continue the enormous workload of scheduling meeting places, putting out a newsletter etc., so he arranged to merge AUSOCAL with IEAUG.

A compromise location in Anaheim, California was convenient for both groups and that is where it is today. The AUSOCAL newsletter was published for about three years.

-In July 1985, Jono Smith embarked on his short-lived California ADAM Users Group, (CAUG), with a single issue of his newsletter. Greg Noblette was his assistant editor. It was a good publication but lacked organization. Jono later became the Sysop of the ADAM forum of the Family Computing section on Compuserve.

(Jono's predecessor as Compuserve Sysop was John Mesiavech, a giant of a man in both physical and intellectual dimensions. John lived in Glendale, California and attended a number of our IEAUG meetings despite the very long drive. Before moving to the Family Computing Forum, John was the mainstay at the Creative Computing magazine's ADAM section on Compuserve. Later, when he was billed for over $900 by CIS, (which John maintained was in error), he abruptly left CIS and the sysops job fell to the 12-year-old Jono Smith. Shortly afterward, John bought an Amiga and sold the residue of his ADAM equipment to Tom Ball of IEAUG.

-Another independent publication, not affiliated with a users group was the Expandable Computer News published by Sage Enterprises. It began publication in April of 1984, which makes it one of the earliest, if not THE earliest ADAM newsletter. It was largely written by Darrel Sage, but there were many regular contributors who were among the most prolific writers of that time.

Sage Enterprises was also a commercial venture. Toward the end, their interest turned to the Amstrad computer and very shortly thereafter, the bi-monthly ECN folded.

-The Kansas Coleco ADAM Users Group under David Carmichael, began publishing their newsletter from Wichita, Kansas in November 1985. It has been a mainstay in the ADAM community ever since. David Carmichael has also been very active in PLINK, which has one of the friendliest ADAM forums in the country.

-The following month The Greater Cincinnati ADAM Users Group began publishing a newsletter from Covington, Kentucky. It was the work of Harold Orndorff and Keith Bowman.

-the Denver ADAM Users Groups began publishing newsletters. The Denver newsletter was a bi-monthly publication by Jesse Thornhill II.

-I wonder how many of you recall the ADAMNET. It was the property of Don Reese and generally operated out of Arkansas. It had numerous addresses in Arkansas.

Although it was a commercial venture, it had a large impact on the ADAM community. Ultimately, it too vanished. (Don Reese is now living in Diamond Bar, California and has disposed of all of his ADAM gear as well as his huge collection of ADAMANIA. An IEAUG member, Bob Gorden, of Yorba Linda, California bought his equipment. IEAUG has his vast library of computer programs, (disks), and written documents).

In the year 1985 there were a few more influential user groups founded. If they published newsletters, I have never seen any.

The Bellevue AUG was started by Norm Castro in the Omaha, Nebraska area. Norm is still very active and has the exclusive rights to sell the back issues of Expandable Computer News and some other now extinct newsletters. (see the chapter by Norm on Newsletters).

-There was a group that Don Zimmerman started in the east, called the Genessee Valley AUG.

-Russell Williams in New York City founded the Metro AUG.

-In Bloomsburg, Pa. Steve Chamberlain formed the (717) ADAM Users Group.

-And in El Paso, Texas Dick Lewin formed an ADAM Users group.

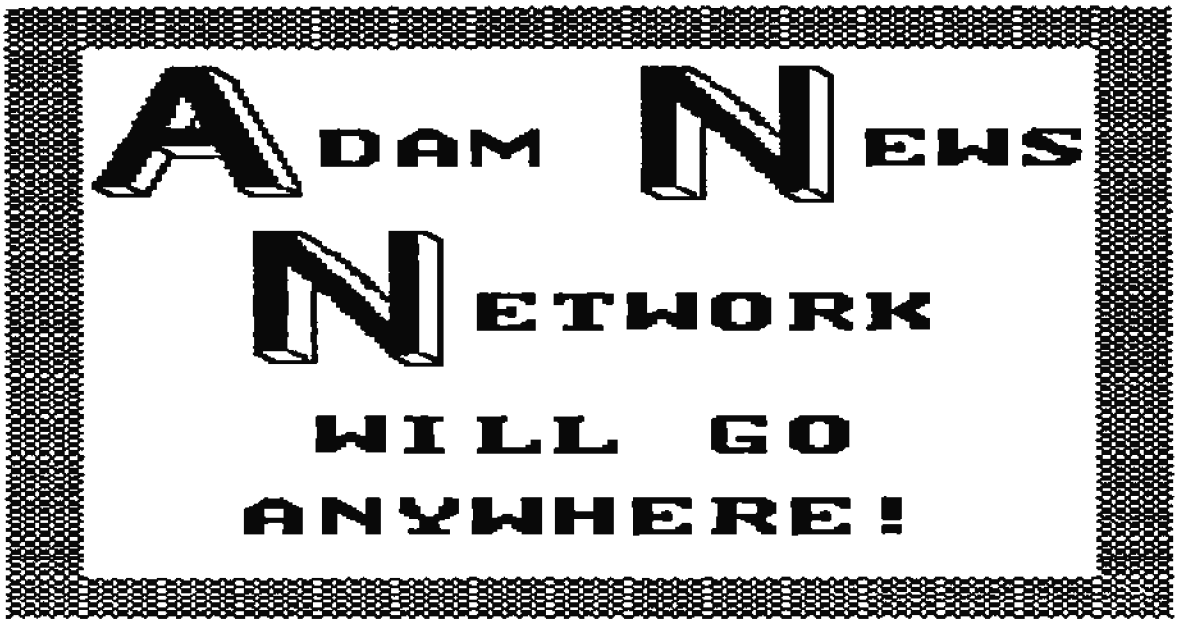
-Brian Stranahan was listed in almost every newsletter in the country as having the Southern California ADAM Users group. This was never the case. Brian did attend a number of the early meetings when plans were being developed for a users group; but he dropped out, and to my knowledge, there never was a group led by him.

-Another piece of nostalgia concerns two early hardware companies.

The first was the EVE ELECTRONICS, in Vermont. Eve produced 64K memory expanders etc. there demise occurred as other work interfered with ADAM work.

The second was a company known as JJ's Gourmet Hardware and Software Exchange. It was later to be known as Orphanware and later still as CL Digital. And now, according to it's founder, John Lingrel, it is Gone With The Wind.

Thomas J. Keene
IBAUG



THE CREATION OF ADAM

by Phil Kosowski, former employee of Coleco

COLECO INDUSTRIES INC., the "COLECO" part of whose company name comes from the company's original name "COnnecticut LEather COmpany", was in some ways a very amazing company. I still remember being on an empty floor when a high up official gave the order to start making boards. Within three hours the floor went from empty, to having a line set up and running. The line was assembling digital data drive boards.

They were taking bare circuit boards, stuffing them with parts, then putting them through a wave soldering machine.

That day I was impressed on how much could be done by this company in such a short time period.

I have heard Adam owners 'putting down' the Coleco Co. for stopping production and support of the Adam and ColecoVision. But I feel that these people are unaware of the kind of dedication that was typical of Coleco with respect to their products.

Coleco was a company that, throughout its existence, has gone "all out" on a number of different products. Some of these products earned them large amounts of money, and others almost sank the Company. The Adam was one of (the products that placed a large financial strain on the Company.

Why was support dropped for the Adam? I not sure, but most likely it had something to do with deals Coleco made at the end of 1984 or beginning of 1985, when Coleco decided to get out of the electronics business.

Coleco put a great amount of effort into the Adam, even to the point of selling off some very profitable products in order to generate a cash base to continue production. One such line that was sold off, was the 'above ground swimming pools', of which Coleco was the largest manufacturer in the country.

Coleco went all out on the Adam, taking a great finacial risk, which, because of certain events, did not work out as they might have hoped.

The only blame that I put on Coleco is that they released the Adam too soon. The bugs should have been worked out before the Adam was released to the market. The releasing of a computer that did not work, wrecked consumer confidence in the Adam name; and still today a bad impression remains in the minds of many people about Adam. I cannot believe the number of people whom I know, who bought Adams when they first came out, and returned them because they would not work.

The Adam was an extremely large project for Coleco to start up. Coleco not only produced most of the circuit boards and assembled the printer, data drives, and memory console; but also produced its own plastic and metal parts for the printer, data drives and memory console. The metal parts such as shields and power supply chassis where made in Coleco's Gloverville, New York plant. The plastic parts such as the housings, covers, latches, etc., where made in Coleco's plastic plant in Mayfield. Coleco even made its own computerizied test equipment for test boards and assemblies, (in Amsterdam New York).

The amount of testing that Coleco performed was just unbelievable. The testing that was performed on various parts of the Adam was done with computerized test equipment.

The testing that the data drive went through was:

first, the read/write and servo boards would each go through a short test,

second, they went through a go-no-go test, and

third, through a final tester for that much of the assembly.

Fourth, the boards were put together and went through another go-no-go test, and

fifth, went through another final tester for that much of the assembly.

Sixth, the boards were then assembled in a data drive, and,

seventh, were tested again before going to,

eighth, the "one hour burn in" test. This test read and wrote to every block on a blank tape, and took about one hour to perform. That is why Coleco called it the "one hour burn in" test. After this test,

ninth, the data drive was installed in a memory console and was then tested again. When the memory console was paired up with the rest of the items that make up a Adam system,

tenth, the data drive was tested again.

This basic testing method was done on all the Adam items that were made by Coleco.

The Adam family computer system package consists of the following items: memory console, keyboard, printer, two joysticks, digital data drive, along with various cords and cables to connect items together and to the owner's TV.

The Adam was produced in two forms, one for the US and the other for the Canadian markets. The only difference between them was in the memory console and the power cord for the power supply.

The whole Adam computer system people refer to as the "stand alone". The Coleco workers called the memory console the "delta", and the printer had a flat cord.

The second system which requires a ColecoVision, is the expansion model #3; (which Coleco workers called the "Gamma"), and the original power cord was round. The expansion module #3 was made for people who owned a ColecoVision, so they could expand their ColecoVision into an Adam Computer. The memory console of the expansion module #3 is only different from the "stand alone", in that with the expansion module #3 or "gamma", a monitor cannot be used unless the "gamma" is modified.

There were two different models of expansion module #3 available; one for the US and Canadian markets and the other one for overseas markets. There are two differences between them. In the overseas model, the power supply in the printer was for 220V at 50Hz, and the memory console was wired for a language board. This was done so that the word processing program would pop up in a different language.

I have personally seen an Adam with the French chips working and have heard that German chips were also made.

The way these language boards work is that when the Adam is first turned on, it checks the center expansion slot first to see if anything is there. (If the slot is empty it then goes to the normal EOS chips). When a language board is installed in the center expansion port, the EOS and word processing chips are installed on it; and the normal EOS and word processing chips on the logic board are removed.

So when the Adam is turned on the Z80 searches the center slot and reads the EOS chip from the language board into upper RAM. Then when someone presses the word processing key the system reads the word processing chips on the language board into lower RAM, which would turn out to be whatever language is installed on it. By having a set of language boards one can switch between languages by just turning the Adam off, inserting a different board, and turning the Adam back on.

A simplified explanation of how the Adam works begins by explaining that the Adam is a "280" computer. The Z80 micro processor controls the Video output and also the master 6801 micro processor, according to the instructions provided by ADAM programmers. Similarly, the master 6801 controls the memory RAM, and also the slave 6801 micro processors. It can control up to 15 total devices. Each hardware component has it's own 6801 slave micro processor. The 6801 micro processors are linked together by a 62.5K bps, half Duplex, shared serial bus which Coleco called Adam Net.

The Memory Console, (Delta), houses a cartridge slot, two printed circuit boards, two Adam net ports, three card connectors, an expansion port, a TV port, a monitor port and up to two digital data drives. The two printed circuit boards are the game board (top board) and logic board (botton board).

The game board is the same as that of a ColecoVision with buffers added to it. This board has the 16K video ram, a cartridge slot, a TV port, a monitor port, and the Z80 on it. The clock frequency of the main clock is 3.58 MHz, the video chip clock is 10.74 MHz, and the sound chip modulator uses a 4.5 MHz circuit. A couple of different revisions were made, but all will work with any revision logic board. The game board has no effect on what revision the memory console is. This board was produced in both the US and Taiwan.

The logic board contains the 64K of standard RAM, the EOS and word processing chips, the master 6801 microprocessor, an expansion port, and also various slave 6801 micro processors.

This board, (and the ROM EOS and ROM SmartWRITER programs on the board), went through many changes. Some of the different revisions floating around are 57, 59, 77, 79, and 80. To find out which revision you have, turn your Adam on and, in electric typwriter mode, press the control key and R key at the same time. A smart key, (SKIV), will appear showing what revision you have. For example, "R80" will appear if you have the latest and the best revision that Coleco produced.

If you don't have an "R80" EOS/SmartWRITER ROM, your board can be converted by Kosowsky's Adam Repair to an "R80". (See

the author's name under "DEALERS AND SUPPLIERS" chapter in this book).

This board was manufactured in both the US and Taiwan.

The digital data drive was produced in three different models. The first model was known as the "US made data drive". When first produced, these drives had various problems and I believe that this was one of the reasons for which production of the Adam was held up just prior to public release.

One particular problem that I personally recall, was caused by a simple mistake on how a part was specified on a drawing. The straightness tolerance of the pin upon which the encoder wheel rotated, was not called out correctly. So what happened was that Coleco received a box about 8" square that had 10,000 encoder pins in it, each of which met the drawing specifications, but only about 30% of which functioned properly. These were sent back to the manufacturer, and Coleco ended up sending an employee out of town for about a week to sort through these 10,000 pins to find good ones to use. They where in a hurry and needed the pins badly.

Luckily, I was in a car pool that day and didn't have a car, or yours truly would have been the one doing the sorting! These drives were made in Amsterdam New York in building #6.

Production was stopped on the US drives in 1984 in favor of using the new style JVC drives. The second model and third model were both made by JVC, and were known as the old style and the new style JVC data drives. The old style JVC drives were produced near the beginning of ADAM production in 1983 after some of the bugs had been worked out of the US drives. Basically the old style JVC and the US drives were the same, with only some small differences.

If you wish to tell them apart, look at the motor drive hubs and the label which states made in either Japan or US. This is not a certain method of identification however, since tape drives which may have gone through the repair lines in Coleco, sometimes got the back plastic covers switched. What this means is that sometimes a "made in the US" drive has a "made in Japan" label and sometimes a "made in Japan" drive has a "made in the US" label on it. The hubs on the US tape drives have a spring behind the hubs and the Japanese drives do not have these springs.

The third model has many improvements over the first two models. Some of the improvements are: speed adjustment screw on top, (which means that the speed of the data drive can be adjusted without having to remove the drive from the memory console); holes added on the top shield and on the sides of the plastic housing, (increasing air flow thus reducing temperature); improved head mounting, (wires being attached with screws rather than with solder); better tape mounting/ejection system; connecters added inside drives; tape insertion button made longer, (resulting in less error readings that a tape is not inserted when it is); and generally better quality then either the US or old style JVC drives.

With all of these changes, it is easy to see which are the new style JVC drives. The easiest way to see is that the motor screws on the new style JVC drives are flush with the plastic; and that two out of the three screws line up vertically. On both of the older drives these screws are not flush, and none of the motor screws line up vertically. Both models of the JVC drives were built in Japan.

The Adam keyboard has 75 full travel keys, including ten command keys and six programmable function keys. These keyboards are very dependable and were produced in Japan.

The Adam printer is a friction feed Bi-directional letter quality "daisy wheel" printer. The printing speed is 10 characters per second and the pitch is 10 characters to the inch. The printer contains two printer circuit boards, the printer logic board and the Adam's power supply. The printer logic and power supply boards went through various different revisions, but all revisions will work fine.

The printer itself went through one major change which was associated with the printing head. The printing head and printing head switch where greatly improved to increase reliability, print quality, provide a better adjustment system, and to make it slightly quieter. The change made on the printer head switch was to change from the troublesome contact points to a micro switch. The printing head was re-designed by replacing the mechanical 'hammer type' print mechanism with an electrical solenoid printing mechanism. Also parts where added so the printing head could be adjosted with a screw driver instead of a pair of pliers. Near the end of production the contact point switch in the gear train was also replaced by a micro switch.

The printer was produced in Mayfield, New York, in Coleco's building number 1, known to us then as the "Patch Road Plant".

There was also an optional tractor feed mechaoism which was never offered for sale to the public by Coleco.

The ADAM disk drive is a double density single sided 160K half height drive. The disk drive was built in Singapore by JVC. The drive, like all other hardware, was tested in

Amsterdam, New York.

The memory console was designed to have up to 15 devices attached on the ADAMNET. Any device that Coleco made to connect to the memory console; like digital data drives, disk drives, ADAM printer, keyboard, and RS232 parallel/serial printer interface; all use the ADAMNET. All other hardware options plug into expansion ports or card edge connectors.

Under the top ventilation cover, (on top of the console), are two 8 pin and two 9 pin connectors.

Two digital data drives can be installed in the console by plugging them into the two sets of 8 and 9 pin connectors.

Two disk drives can also be attached by plugging the first drive into the console through one of the two Adam net ports external to the Adam case. (These are designed in the form of telephone jacks, one on the left side, and one on the front, and although they are marked individually as "KEYBOARD" and "ADAMNET", either the disk drive or the keyboard may be attached at either jack). The second disk drive plugs into the first disk drive.

Concerning the three card connectors under the top lid; the one on the right is for a memory expansion board. Coleco made a 64K memory expander but several other companies have since produced expanders anywhere from 64K to 1Meg! The center card connector Coleco intended for 32K ROM cards and an 80 column card. This connector today may be used for a parallel printer interface or an addressor card interface. The connector on the left is for the Colecophone modem, and Coleco also planned this for a real time clock.

On the back of the console are outlets to which a TV or composite monitor can be attached.

On the right side of the console, is a "card edge" expansion port to which the ATARI 2600 Adapter can be attached. Coleco also made some prototype 8 inch disk drive interfaces that used this port. These interfaces were only used in-house and were never intended to be offered for sale. Some other companies have also designed devices to use this port, devices like 5 1/4 inch double sided drives, a parallel/serial interface, and an 80 column video display expansion card.

The cartridge port on the top of the console had some prototype devices made to operate from it, like tape drives and drawing pens.

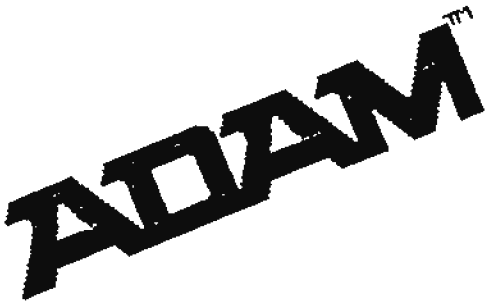
There were also two hardware devices of which I know that Coleco planned for the printer. One was a printer tractor feed which was to attach to the top of the Adam printer.

The other was an RS232 parallel/serial printer interface. This interface was to plug into the memory console in the same way as the Adam printer is plugged into it. Then the Adam printer was to plug into the printer interface. This interface would provide for printing on a parallel printer, serial printer, or the Adam printer. No patches would have been required. One would simply flip a switch to select the desired printer. One could have even switched between printers as they were printing, by flipping the switch while printing was in progress.

Of course there are many other hardware devices from many fine companies like 80 column board for T-DOS, the user friendly repacement of CPM; M.I.D.I., (music keyboard interface); speech synthesizers; serial/parallel printer interfaces; serial ports; hard-disk interface; heavy duty power supply; sound digitizer; mouse; tape formatter; and clock. (See the chapter on "HARDWARE FOR THE ADAM" and "ADAM MUSIC WITH A MIDI" in this ASG).

Phil Kosowski

EDITOR NOTE: For more details concerning the upgrades mentioned in this chapter, contact your user group or the author. (See "IMPORTANT NAMES AND ADDRESSES" in this ASG).



THE "BASE ADAM"

by Dean Roades - Associate Editor of ANN

BASE ADAM, refers to the ADAM as it was when you took it out of the box. It was, and still is, the best home computer on the market. It also has the reputation for being the most advanced electronically designed computer of any of the 8 bit computers.

Everything you need is right in the box: the CPU, (Central Processing Unit) with 64k of memory plus 16k of video memory; a storage device for storing data and programs on a storage media, (Digital Data Drive); and the infamous ADAM printer.

(Yes, the ADAM printer is slow, and, yes, it's noisy, but it works very well, and you can't beat the LETTER quality. Now that isn't "near letter quality", but LETTER QUALITY, a printed page that looks as good, (or better), than anything typewritten).

You could connect your ADAM to a TV set or a monitor and you were ready to go.

The ADAM has gone through many changes since it was orphaned back in 1985.

Just about anything that is available for other computers is available for our ADAM. Disk drives, (5-1/4" and 3-1/2"); Hard drives; external and internal modems; memory expansion, (up to 1024k or 1 Meg); high speed dot matrix printers; clocks; sound digitizers; midi musical interfaces; and more.

The question is, do you need these things in order to make ADAM useful?

NO YOU DON'T! These hardware add-ons will make ADAM MORE useful, but they certainly are not required for ADAM to help you with many chores.

In this section, we will look at software designed for use with the BASE ADAM, and then list some of the tips and tricks especially useful to those with a BASE ADAM.

SOFTWARE

Note: There is more ADAM software available than you can imagine. The following list is not intended to be all-inclusive, nor is their any intended implication on our part that software that is not listed is any less worthy of your consideration. We are simply trying to give you an idea of ways to use your 'BASE ADAM'.

COLECO Software

ADAMCalc, SmartFILER, LOGO, ExpertTYPE, Flashcard Maker, and the other original Coleco software packages are very good. They all work well on the BASE ADAM and many can take advantage of the newer hardware add-ons.

The quality of some of the programs developed for the ADAM was the best of its time; in fact, LOGO is considered by many to be the best version of LOGO done for ANY computer and ADAMCalc has received high commendations by computer magazine publishers. ADAMCalc is regarded as one of the best spread sheet programs by many.

SPEEDYWRITE (c) White Software

An excellent word processing program, it is very useful on the BASE ADAM, and can accomodate additional hardware if and when you decide to add it.

SignSHOP (c) Strategic Software

It's a very nice program that will print signs, banners and cards on the ADAM printer. The pictures are not equal to those that can be printed on a dot matrix printer, but are very nice, given the intrinsic limitations of printing graphics on a daisy wheel printer.

NewsMAKER (c) Strategic Software

This is a Desktop publishing program which integrates graphics and text in a variety of page layouts.

MicroWORKS (c) Strategic Software

It integrates a text editor, data base, spreadsheet, graphic editor and chart generator in one package.

PaintMASTER (c) Strategic Software

You design hi-resolution graphics and print them with the ADAM printer.

MultiWRITE (c) Strategic Software
This is a word processing program that displays 64 columns on screen, instead of 32 columns, without hardware add-ons.

VIDEO TUNES (c) Future Vision
You can compose, store, and play music.

PUBLIC DOMAIN PROGRAMS

There are thousands of Public Domain programs in the "PD" libraries, from just about every ADAM user group and from many ADAM suppliers. They range from balancing your checkbook to printing custom labels for cassette tapes. All are very useful, and most can be used with the BASE ADAM.

EXPANDING YOUR ADAM

You may have a base ADAM right now, but what about the day that you want to expand? One of the most frequent questions asked is "What do I need?". I will try to outline the most often purchased items, and some of the basic requirements for adding them to your ADAM.

DOT MATRIX PRINTER

This is usually an "Epson compatible" dot matrix printer. There are many brands that will work. I own a Panasonic KX-P1080i, but Star, Epson, Okidata, and others will do a fine job too.

The addition of a Dot matrix printer requires that a parallel printer interface be connected between the ADAM console and the new printer. This can be a PIA2 parallel interface only, MIB2 board with Parallel and serial interfaces, or the EVE parallel/serial interface. The first two plug into the center slot under the cover of the ADAM console, the latter plugs into the expansion slot on the right side.

A cable is needed to connect the printer to the interface. More often than not, these cables are sold by the supplier providng the interface.

Software is needed to tell ADAM how to communicate with the DMP that is connected. Many of these programs are in the public domain.

DISK DRIVE

Disk drives usually come complete with everything you need to set it up. If you are lucky enough to find one at a garage sale or swap meet, some of the components may be missing. The complete set-up includes; disk drive, cable to connect to ADAM, a power supply, a Disk Manager disk, and a manual.

MEMORY EXPANDERS

The 64k expander is rapidly becoming a necessity. Many of the programs being written today are so extensive that this additional memory is needed. The good news is that the price of the memory chips is currently low so you can get a 64k for $30 - $40. If you want more memory for your ADAM, (don't we all?), you can get a 256k or larger expander. This allows even more versatility when using many programs. The larger memory boards require a connection to a parallel interface or addressor card, while most 64K expanders are housed within the ADAM console.

MODEM

There are two modem set-ups that will work on the ADAM, and work well they do!.

The Coleco, internal, 300 baud modem plugs inside the console (left slot), and is designed to be connected to your telephone jack with the supplied wire. These modems are in scarce supply now, so if you want one, start looking immediately.
The second modem set-up requires the use of a serial interface. These are the same as mentioned in the DMP, (Dot Matrix Printer), section. I think any "Hayes compatible" modem can be hooked up this way.

The advantage of the external modem is speed. The Coleco modem is only 300 baud, external modems are generally 2400 baud or more. This allows faster transfer of information when you are on-line.

(The "baud rate" value is a measure of how fast electronic pulses are sent and received by the modem. Modems with a higher baud rate capability can usually be set to some lower baud rates to make them compatible to lower baud rate modems, whenworking with such).

THE ALL IMPORTANT BACKUP!
by Jim Motini - MIAD

How many times have you read in ... fine ADAM publications about the importance of making a "backup" copy of all your important data files and programs? A hundred times? A thousand time? More? Probably more than you would want to read, but this topic will always arise in newsletters because it is one of the most important aspects of owning a personal

computer.

The importance of maintaining backup copies of your programs is magnified hundreds of times over in the case of the ADAM Computer, due to the fact that there generally aren't any local computer stores in the locale where you can stop by to have a corrupted disk or DDP recopied or replaced.

In order to get a program repaired, you will more than likely have to mail it off to your favorite ADAM Users Group, if you aren't fortunate enough to have other ADAM owners in the area who have the program! Since many ADAM owners are located hundreds of miles from such ADAM organizations, time will play a major factor in the program getting to the AUG, fixed and then mailed back. This is time that some people, or some situations, just cannot afford to waste due to deadlines for work, school or personal reasons.

HOW TO MAKE IT

Now exactly do you go about making a backup copy of a program or of data files, so as to prevent future headaches?

The first step would be to purchase a copy program such as BACKUP 3.0, BACKUP+ 3.0, KOPYKAT, QUICKOPY V5.0, FILE MANAGER V2.0, SmartDSK III & UTILITIES or UNCLE ERNIE'S TOOLKIT. There are also many other commercial and public domain programs which will allow the user to create a copy of a disk or data pack to another disk or data pack.

From my own personal experience, I would reccommend the purchase of either FILE MANAGER V2.0 or SmartDSK III & UTILITIES. Both of these programs support any size memory expander as well as any size disk drive which you may own, and also include many other utilities such as file copiers, block editors, block copiers, format and init routines, editors, etc.

My personal choice for the best utility program would be FILE MANAGER V2.0 by AJM SOFTWARE ($17.95), due to how easy it is to use and the vast amount of functions it can perform.

SmartDSK III by WALTERS SOFTWARE CO, ($24.95), would be my second choice, especially for those occasions when I have to make multiple copies of some PD program that I want to distribute. This would be my preference, since SmartDSK III allows the user to set up a ramdisk to which he can copy a program or files; and then make as many copies to a disk or data pack from the ramdisk as he desires, (this saves wear and tear on physical drives and reading from the ramdisk is thousands of times faster than reading from a disk or data pack).

SmartDSK III's copy program is also one of those available today, that will adjust the number of blocks remaining on the destination disk or data pack when you are copying from, and to, different sized drives!

PREPARE EMPTY MEDIA

The next step that must be taken, is to insure that you have an ADAM formatted disk or data pack available. If not, many of the aforementioned programs allow for the formatting of disks from within their respective copy programs.

But data packs cannot be formatted. You will need to buy them, or create your own with the MegaCOPY III device by TRISTO VIDEO. (See chapter "HARDWARE FOR THE ADAM" in this ASG).

Once you are set up with a blank media, (disk or data pack), you may go through any one of three methods to create a functioning copy. The method you choose will depend upon the end result desired, as you will see as the discussion continues.

METHOD 1: Use the standard BACKUP MEDIA (or IMAGE BACKUP) option to create an exact copy of the source media.

This option is sufficient for most purposes, and is the most simple method; since all you have to do is to specify the source and destination drives.

But remember that if you are copying between different sized drives, be sure that the source does not contain more used blocks of data than the destination can hold; or obviously your copy will not contain the entire contents of the source media.

In addition to that concern, (when copying between different sized drives), be aware that your copy will also contain an exact duplicate of the directory block of the original, and therefore the "BLOCKS LEFT" information will be incorrect"

METHOD 2: Use a "BLOCK COPY" option which allows the user to specify a range of blocks to copy from the source, and to also designate the starting block at which the data will start to be written on the destination media.

This option is a great time saver if you know that the source, for instance, only contains 50 used blocks. Therefore, you can specify to copy only the 50 blocks from the source to the destination instead of using the BACKUP MEDIA option which will copy all of the source blocks to the destination.

METHOD 3: Use a FILE COPY option, (this works only on DOS format media) to specify certain files to copy from the source to the destination.

This is the option that I use for most of my copying, since it allows me to copy only the files from the source which I want on the destination. And inasmuch as I do not trust any PURGE or CRUNCH utility for any computer to remove deleted files, this is the only choice left available.

When using FILE COPIERS, also remember that if the source program that you are copying is an auto-booting program, that you will also need to copy the BOOT file entry which will then cause block 0 from the source media to be copied to the destination block 0. If this is not done, your new copy will not self boot when the "computer reset" switch is pulled, and your destination media will be useless.

Some copy programs may not be designed to copy the BOOT block into the correct block, and therefore you may have to use a block copy method to select that particular block to be copied from block 0 of the source, to block 0 of the destination.

There are many other potential problems of which to be aware when making backup copies.

An example of this is the existence of Right Directory Data Packs. These data packs were used by Coleco for their supergame packs, (Buck Rogers, Zaxxon, Jeopardy, Troll's Tale, etc.), and when copying a supergame to a data pack, you will need to copy it to a Right Directory Data Pack.

If you attempt to copy the supergame, (whether it be from disk or data pack), to a Center Directory Data Pack, the backup will not operate. Also, the safest way to copy a Right Directory Data Pack is by using a BLOCK COPIER and copying all blocks (0 through 255) from the source to the destination. BACKUP 3.0 and BACKUP+ 3.0 by MMSG are the only programs of which I am aware that offer an option specifically for making backups of Right Directory Data Packs.

GENERAL REMARKS

Most of all, remember that copy programs were developed to allow the user to create backup copies of their programs, not to be used for making copies of programs to trade with others or to sell. Don't be a PIRATE, BOOTLEGGER or whatever else you may call it since it will only lead to the loss of programmers who would otherwise continue to develop software for our system.

There aren't very many talented programmers left for the ADAM and more seem to be moving away from the ADAM each month due to this piracy problem! You can help build ADAM, or you can help destroy it; depending on whether or not you decide to steal!

RUNNING PREPARED SOFTWARE

From 'THE HARRIS FILE' by John S. Harris, MOAUG

This is an update of an article by Pat Herrington which originally appeared in the MOAUG newsletter several years ago.

LOADING PREPARED SOFTWARE

First of all, if loading from a tape, and the tape does not spin at all; or if you get an "I/O error" message when trying to load a prepared BASIC program, the tape is probably not inserted properly. Remove it and re-insert it.

If this does not work, remove the tape and rewind it a turn or two, (gently) and re-insert it.

If this doesn't work either, the tape is probably bad, but this is a rare occurance.

If you get a tape that just spins and spins incessantly, you can stop it by pulling the "CARTRIDGE RESET" switch on the drive console. (It will not always stop immediately, but it won't take very long).

If you have two tape drives, make a habit of loading from the first drive until you know what's on the tape; some programs look to the first tape drive for additional data etc., and therefore only load properly from this drive.

The only way to tell if a media is self-booting is by putting it in to the appropriate drive, and pulling the "COMPUTER RESET" switch. (This is called "booting".) If there is a SMARTBASIC program on the media, with the required boot block routine to load it, etc.; you soon will see a blank screen and then a screen with the program name, and finally the cursor will begin to flash when it's ready.

If a tape is not self-booting, when you pull the reset switch, the media will spin for a moment or two, then the computer will usually, (but not always), default to the word processor. When this happens, remove the tape and put in a BASIC tape. After BASIC has loaded, you can then remove the BASIC tape and insert the program tape. Do NOT pull RESET at this point! Just type in the word CATALOG and press the <RETURN> key to get a directory list of the programs on the media.

If the cursor appears but doesn't doesn't flash, nor does the program name appear at this point; there is a "HELLO" program on the tape, and the BASIC program is searching for it,

loading it, and beginning its execution. (Any file named HELLO will run immediately after BASIC is loaded by the boot routine). Usually a HELLO file is a directory or menu program, or changes screen colors, or gives instructions, or something like that.

If there is no HELLO program, the first thing you want to do after the prompt appears, is to type "catalog", and press "RETURN", to bring up a display of the directory of the media. In this way you can find out what is on the media. (For SmartBASIC commands like this, SmartBASIC doesn't care whether you type in caps or lower case).

(This operation of pressing the RETURN key, is also called "ENTERing"; because on many computers the "RETURN" key is labeled "ENTER". When you encounter instructions that tell you to enter something, you know you have to use the "RETURN" key. If instructions say, for example, "press any key," you shouldn't have to push <RETURN> afterward).

The directory will show you what programs are on your media. You will notice that the filenames have letters and numbers to the left of the filenames.

The numbers will tell you how large the programs are, i.e., how many media blocks they take up. (Some excellent programs take up only a block or two.) There are 256 blocks of 1024 bytes, (or characters); each on a tape. There are 160 blocks on a standard single-sided disk, 320 blocks on a double sided disk, and 720 blocks on a 3 1/2 inch disk.

The letters tell you the "filetype" of each file. BASIC files are designated by a capital 'A' (or a lower case 'a' for backup). SmartWRITER files and binary files of whatever origin are "B" and "b" files for the primary and backup files respectively.

If there is an asterisk (*) beside the filename, the file is locked, and you can't delete it without unlocking it. You can use this feature feature to prevent accidental loss of an important file through "INIT"ing a media.

As indicated above, if the file is a BASIC file and is designated 'N' (or 'n'), it is not an ordinary BASIC file.

It may be a BASIC file which has been "binary saved" for faster loading. Such files use different commands. They use BRUN instead of RUN, and they cannot be read from the word processor. They can be LISTed, though, and they can be saved.

When you save such a file to binary form, use a different filename than that used in the "A" filetype form. The SAVEd version will be in standard BASIC, with one filename, and the BSAVEd version will be a binary file with a diferent filename.

On the other hand, an N file may be a document file generated by the Smart Writer word processor.

Look at your filenames for your N files and see if any of them contain the following combinations of letters, either as a whole word or as a part of the end of the filename: Doc, document, instruct, read, readme, readmelst, hlp, or help, or something similar. These are key expressions used by many computer users to indicate a text file.

If a file reads something like "SpriteDOC" or "LABEL_HLP", it is a documentation file designed to help you get started with one of the programs. Exit to the word processor and read these files. (From BASIC you can go directly to SmartWRITER by typing in "CALL 64743" and press return in the immediate mode).

After Electronic Typwriter comes up on the screen, press ESCAPE/WP and the screen will go to SmartWRITER. Press <STORE/GET> key, choose the correct Smart Key for the drive you want, select the file you want when the names of the files appear, and finally press Smart Key VI to GET the file.

(If the file is new to you and has more than a few lines, you may want to print it out to study at your own leisure)

The word processor will also GET and SAVE "A" files, but to save a file as an "A" file, it must have been loaded as an "A" file. You cannot generate original "A" files from SmartWRITER.

You can however load an "A" file, delete the text, insert the new text, and re-SAVE as an "A" file. Do not use the CLEAR function to do this since the file will lose the "A" designation when the CLEAR sequence is used.

If you have two tape drives, you can load BASIC from the first and put the other tape in the second.

If you BOOT an original unchanged copy of BASIC from a disk drive, it will look for the HELLO program in tape drive 1. This is an instruction built right into the BASIC program for some unknown reason. If there is no media in tape drive 1 then the BASIC program just waits until one is inserted. It will wait forever if you let it.

However a simple one byte change to the BASIC program on the media will allow it to look for the HELLO program from whatever drive you use to do the BOOTing.

If you BOOT from drive #1, (be it disk or tape, whatever), and then you want the directory displayed for the media in drive #2; you must type "CATALOG,d2" and press RETURN. From that

point on until another "dnx" appendage is given to one of the commands accepting it, n2 will be the new default drive number.

If you do not place the drive number appendage, the drive will be considered to be the last default specified, or if none has been specified since BOOTing BASIC, the default remain the BOOT drive.

So far, we have been discussing BASIC tapes and disks. If the media contains programs saved from LOGO, you can not run those programs from BASIC. But you can still read them from the word processor. The same is true for many files written with Coleco programs such as SmartFiler and ADAMCalc.

However, if the files are in binary or if they are T-DOS files, (the user friendly replacement for CP/M); or some other form not interpreted by the EOS, the word processor will print, "Cannot access this file." That message could also mean the tape is damaged or the program is larger than ADAM's memory, but usually it means that the file on the tape that you requested is not an EOS type file.

Since the directory of a T-DOS media is completely different from that of an EOS file, these files would not even appear on the Smart Writer or BASIC directory display; and the "I/O ERROR", or "CANNOT ACCESS THIS FILE" message would appear whenever you requested a display of the directory.

And now let's get back to the idea of documentation files.

If you have just received an EOS type media with some BASIC program(s) thereon, maybe you didn't find any SmartWRITER documentation files, but that does not necessarily mean that there is not any documentation.

Sometimes the documentation is internal using imbedded comments; that is, the program itself contains REM, (Remark or Reminder), statements which clarify certain segments of the program. You can learn a lot about many public domain programs by simply LISTing the program and studying the REM statements. This can be an extremely helpful source of information, but it is often overlooked, even by experienced ADAM owners.

So, with your directory display on the screen, choose a file labeled with the filetype designator 'A', and type "LOAD" followed by the file name. Then press "RETURN". (Be sure to type the filename exactly as it appears in the directory, including caps, lower case, and/or punctuation. You do NOT have to type in the letter 'A', or any of the other characters appearing to the left of the filename.)

The media will spin and the cursor will stop blinking while the program loads. When the cursor blinks again, the program is in memory. Now type "LIST" press "RETURN", and it will list all of the instructions and REM statements. Study teh REM statements for documentation.

To RUN the program, simply type "RUN, press RETURN, and teh program will begin execution.

An alternative, (if you don;t need to see the LISTing), is to type "RUN filename", and press RETURN; right at the outset. The program will load and execute in one user operation.

HOW TO READ A SMARTBASIC PROGRAM

You can read or print out most BASIC programs from the Smart Writer word processor. You can also LIST the program itself from BASIC, and read it onscreen. You can print the listing from BASIC to a printer too.

To print out a LISTing of the actual program on your ADAM printer:

1. Make sure the program is in memory (LOADed).
2. Put a sheet of paper in the printer.
3. Type in: "PR#1:LIST:PR#0" then press "RETURN".
4. The program will begin listing to the ADAM printer.
5. When you want to stop the printer, particulary to change a piece of paper in the ADAM printer, hold down the CONTROL key and press the S key.
6. When you've changed paper, or are otherwise ready to continue, press any key.
7. When you are through printing, the last command of the above command line, "PR#0", automatically turns the printer off.

You can control the speed of LISTing on the screen, (the command for which is simply "LIST" and press RETURN), by entering in a speed number between 0 and 255. Example: type "SPEED=100" and press return.

For example you could type "SPEED=100:LIST", and press RETURN.

To exit a program, if the program gives you no "exit" option, you can hit ESCAPE or CONTROL C. Sometimes one must "hit" CONTROL C very rapidly to catch the program in a position to recognize it. (Holding the "CONTROL" key down and hitting the "C" key will accomplish this). If that doesn't work, you will have to use the reset switch and start over.

When you try to run a program and you get a message saying "File type mismatch," try using the "BRUN" command, (with B files). If you still get the same message, or a message like "Illegal OS command", enter RUN once more.

If a program asks you to choose a particular keypress, and

then doesn't respond to the keypress, check your shift lock to make sure THAT it's not set for all caps. (See the chapter on Smart Basic I for instructions on how to unlock the keyboard from within a program).

Also check to make sure you are not pressing letters instead of numerals. The numerals one and zero are NOT interchangeable with I,O, and lower case L.

While you are learning to manipulate files in BASIC, be sure that you are using the same version of BASIC that originally came with your ADAM. If you need a new copy, you can get one from any User Group; specify "Plain Vanilla" (version 1.0) Since this article was originally written in 1985, many other "flavors" of BASIC have been developed to add enhancements.

You will surely enjoy experimenting with all of those other BASIC versions, but you'll want to stick with the original at least until you are comfortable with the commands for manipulating files.

Changes made in the original BASIC program that are for the purpose of removing bugs, (like for being able to recover "h" files, for fixing the REM/DATA Space bug, etc.), do not destroy any of the normal capacities of Smart Basic in any way, and simply make the SmartBASIC program do what it was designed to do.

INTRODUCTION TO SMART-WRITER

by Arnold V. Urbonas

So you just bought the ADAM Home Computer System and would like to know how to use the word processor. This series of articles is for the beginner who would like to know how to use the system.

Most of this information will not be new to most of you. The beginner may have the joy of learning about the word processing capabilites by himself, by just exploring and poking around. I know that doing this series of articles has made me more aware of all the different features. All of this information should be somewhere in all your manuals.

When you turn on the ADAM, you have an electronic typewriter until you press the top left hand corner key which activates the word processing unit. Hence the key is labelled ESCAPE/WP. The obvious advantage of the word processor over the electronic typewriter is that you can alter your text until your heart is content, before you print it out.

What is that vertical bar on the screen? The bar represents the space on the page on which your text shall be printed. The 11 refers to 11 inches which is the length of your standard letter size paper. By pressing SmartKEY [I], you can generate different options pertaining to Margin, Tab. etc.

By pressing [I] again (Type of Paper), you can change from the standard 11 inch length of paper to the 14 inch length, (legal size paper). The vertical bar will change in length, and the number on the top will change from 11" to 14". ADAM was designed so that you can print on whatever paper you have available. Once you have chosen your size of paper, press [VI] (Done).

(Note that the following printer/paper allignment procedures were designed to be performed on the ADAM printer. Since there is no "Electronic Typwriter Mode" with a dot matrix printer, obviously allignment routines using that system, will not work on that printer).

Or maybe, just perhaps; you might like to use an odd sized sheet of paper. You can even design the paper length and margins to accomodate the printing of a postcard.

To do this, place your postcard along the left hand side of the printer through the roller. (Make sure you will not print on the nice little picture at the upper right hand corner of the card). Turning off the ADAM and turning it on will activate your Electronic Typewriter. Next, press the space bar and notice that the printer head moves right a space at a time. Press the space bar until the printer head reaches an imaginary right hand margin you would like the postcard to have.

Press;

(1) WP,
(2) [I] Margin etc.,
(3) [II] Horizontal Margin,
(4) [III] for Left, or [IV] for Right margin.

The white marker on the screen will tell you at what position the print head is located on the postcard in the printer.

Next, using the indicated SmartKey, move the right margin, (the dark line at the right side of the top markings), until it "underlaps" the white marker. You have just set your right horizontal margins.

If you wish to set your vertical margins as well, press [V] (To Vertical Margins).

Press [IV] (Bottom Margin).

Then use the arrow keys to bring up the bottom margin, (indicated by the bottom bar on the vertical bar on the left

side of the screen. (The vertical bar will stay the same length, but your bottom marker will move upward as you use the arrow keys. I have found that I get approximately 18 typed lines in 3 inches). Space the margin according to your needs. Then press [IV] (Done). You have before you the markings along the top to mark your width, and you have the side bar with its markings to tell you the length you have available for the text for this particular case of a postcard.

You can write as many postcards as you want now. However, your settings will return to their preset values when you turn your ADAM off. So, in order to keep a record of the postcard printing format, before you turn your ADAM off, you must record your postcards on your data pack or disk. This is done using the Store/Get key and the appropriate SmartKEYs to save your last postcard, text and all.

You can print after saving the postcard format, or you can call up the file to print at a later time. When you print them out, don't worry about setting margins. All the previous planning will come out in the printed copy.

When you are ready to do more postcards, just call up the old file, clear the old card text, and put in the new text, (the format shown on the top bar and left side bar will remain unchanged from one time to the next.

Save the file if you want to print later, or print it out without saving. (Saving is a good habit even when you don't need the format saved, because during printing SmartWriter will often lock up, and the text will be lost. But when the text is as short as it is on a postcard, and very few cards are to be printed: you may rather chance printing without saving, because sometimes freezing of the system also takes place during the STORE process).

Dean Roades

SMART WRITER

compiled by BILL REYNOLDS

The following information has been extracted from the following ADAM supporters and the author.

**** Alan Neely - ADAM Link of Utah Newsletter, THE ADAM INFORMANT
**** Keith Warner - United Kingdom ADG and appeared in NIAD
**** D. Zimmerman - Appeared in NIAD
**** Faye Deere - Appeared in Emerald Coast ADG Newsletter ADGER

FULL SCREEN MOVEMENT
Use the arrow keys, (up, or down, or left, or right), simultaneously with the HOME key to move a screen up, down, etc., one screen at a time in a document.

The HOME-and-left and HOME-and-right keys will take you to the left and right edges of the screen respectively. If you are in the moving window format, it may take you two repetitions to go from one edge to the other, depending on the margins that you are using.

The HOME-and-up and HOME-and-down keys will jump one screen up or down respectively, and the cursor will stay in the same column, and there will not be a 2-3 second pause. Using the HOME key only will jump one screen, move the cursor to the left edge, and pause for 2-3 seconds.

HI-LITE - ERASE HI-LITE
The same keys can be used to HI-LITE or ERASE HI-LITE for large areas as follows.

(This is most easily done in MOVING WINDOW screen format. If you prefer writing in the standard screen format, going to MOVING WINDOW and back is a very fast operation, and has no known bugs. See the explanation of MOVING WINDOW below).

Press HI-LITE and the cursor turns red.

Press HOME/Down Arrow and all of the text from the point at which the cursor began to the bottom of the screen is HI-LITEd. The same effect but in the opposite direction is acheived using HI-LITE and then the HOME/Up Arrow. By arranging the position of the text on the screen and the starting position of the cursor, large selective areas of text can be HI-LITED.

By pressing ERASE HI-LITE and the same combinations of keys, areas of HI-LITEd text can similarly be un-HI-LITEd.

After HI-LITEing text, the HI-LITED characters, groups of characters, pages, or whatever; can be printed, deleted, etc. (for MOVE/COPY only the first and last characters are HI-LITEd).

USE HI-LITE TO PRINT A PART OF A DOCUMENT
After pressing the PRINT key, the PRINT HI-LITE Smartkey will print the highlighted text. Therefore, if you do not want to print an entire document, use this feature.

USE HI-LITE TO SEPARATE AND COMBINE DOCUMENTS
If you have a file and want to use part of it in another document, first save the section of the first document that you want to include in the second. To do this:

Move the cursor to the start of the section to save and hit Smartkey IV (HI-LIGHT), and

use the arrow keys to mark all the words/lines you need to save.

Use the MOVING WINDOW mode, (see below), to HI-LIGHT several lines at a time.

If you have several paragraphs, use the HOME/Arrow keys as explained earlier in this chapter.

If you HI-LIGHT a word or line by mistake, hit Smartkey V to erase the HI-LIGHT marks underneath the mistakenly HI-LITEd characters, words, lines etc., (again as explained above).

After HI-LIGHT is completed, press the STORE/GET key, and then

press Smartkey III (Store HI-LITE).

Name the file and save to tape or disk.

The HI-LITE text is now a separate document.
To combine two documents,

CLEAR the WORKSPACE if the present document is not one of those to be combined; then

GET the first document from tape or disk,

move the cursor to the location you want to place the second document and

INSERT a RETURN character there.

Now press STORE/GET and

select the document you want to add to the first one.

Press GET to load the document.

The second document will be inserted immediately above the point at which the cursor was located. Smartwriter will cause a "filename default" to the name of the second file added. Rename the combined file if necessary by saving it under the desired new name, and re-GETting it.

FILE ATTRIBUTES OF COMBINED FILES

When you combine two files, ADAM will take on the attributes of the second file. This causes a problem with page margins and tabs.

One way to maintain different margins, (if it is desired in such a case), is to use INSERT/DELETE to put a hard carriage RETURN for each line.

Another way is to

save each file under a different name and

enter an END PAGE marker on the last line of the first document.

Then print the document,

clear the screen, and

load the second document with different margins or tabs.

Set the top margin to one and

print the second document.

You will probably find using the MOVING WINDOW screen mode is easier to try the above technique.

The following table shows which attributes change when you merge two or more files; and those attributes which do not change.

ATTRIBUTE	BOOT UP DEFAULT	CHANGE?
Horizontal Margins	Left=10, Right=70	yes
Vertical Margins	Top=6,Bottom=60	yes
Tabs	Every 5 spaces	yes
Type of paper	Letter (11 inch)	yes
Line Spacing	One	yes
Screen Color	Blue	no
Sound	Full	no
Format	Typewriter	no
Name of File	None given on Boot	yes

To place a new file above the present file without having the last of the new file merge right up against the first part of the old file, INSERT an extra carriage RETURN at the top of the original file before getting the second file.

If desired, you can move the new text to another location with HI-LITE, MOVE.

MOVING WINDOW

Many people prefer the MOVING WINDOW function because you can move the cursor around quickly and see a whole screen of data.

To access the MOVING WINDOW mode, and still see all of the text of any line on the screen;

press Smartkey II, then

press Smartkey VI, then

set the right margin to 46.

This will allow an entire line on the screen at once. Do not forget to reset the right margin to 70 (or your choice) before printing the document.

The MOVING WINDOW screen mode must be used when entering columns of data in order for you to line them up correctly. When doing so, remember to put a carriage RETURN at the end of each line by pressing the RETURN key. There is no known method to generate an "eighty column screen" with Smartwriter. Maybe a hardware "guru" out there can come up with a solution.

In the MOVING WINDOW format, DELETE, INSERT, and MOVE/COPY can cause a temporary text displacement on the screen. Pressing the HOME plus the left arrow will re-align the screen.

MAKING A "CENT" SIGN

Have you ever needed to print the cent sign on your ADAM printer in Smartwriter?

The first step is to

store the following one line program under SmartBasic.

1 ? "(ESCAPE/WP)(SPACE)"

Allow me to explain. This is done by typing the "1", the "?" (or "PRINT"), the first quote mark, then press the "ESCAPE/WP" key, then press the "SPACE BAR" , then the last quote mark, and finally the usual "RETURN" key which enters the line in to BASIC.

On your BASIC screen you will see only [1 ? " "], or [1 PRINT " "]. (When you press the ESCAPE/WP key no character nor "character space feed" is sent to the screen, but the ASCII value of 27 is nevertheless loaded to the BASIC command line. Therefore the only thing visible between the two quote marks on the screen is the "SPACE" character that you pressed. However if you "LOAD" the progam back to BASIC and type LIST, it will show 2 spaces between the two quote marks, and a reversed "SmartWRITER RETURN" symbol in the very center.

Store this one line program under a name you can remember. Now

boot SmartWriter and get the one line program. Next

type in your text or get an existing file. Then

copy the top line to where the cent sign is wanted.

After copying the "cent" sign you may backspace to erase any extra spaces, (anything other than the reversed RETURN symbol).

When you are finished with your documeot,

DELETE the top line and priot out your document.

CHANGING MARGINS

To change Horizontal Margins
- Press SK I (Margin/Tab)
- Press SK II (Horizontal)
- Press SK III (Left) or SK IV (Right)
- Use the left or right arrow keys to move the margin left or right
- Press SK VI (Done)

To change Vertical Margios
- Press SK I (Margin/Tab)
- Press SK III (Vertical)
- Press SK III (Top) or SK IV (Bottom)
- Use the arrow keys to iocrease or decrease top and bottom margins.
- Press SK VI (Done)

Sometimes vertical margins will not "take" the first time that you attempt to change them, and must be re-done a second time.

If after going through the operation of changing the vertical margins, there is no hesitation between the time you press DONE, as the time the SmartKEYS re-appear, the vertical margin did not change. Press SKI, then SKIII, and after a hesitation, (you will see the vertical cursor position marker going up and down), the new margins will be in effect.

PAGE LENGTH AND SAVING PAPER

The ADAM default page length is 66 lines to a page. Make use of the ability to change margins quickly and easily to fit a "too long" document oato one page. Experiment to get rid of that last unwanted page with so little on it. Remember, stored documents always maintain the margins in effect when saved. Change them as needed.

CHANGING TAB SETTINGS

TAB settings are incicated by the small white dots on the top of the black horizontal scale bar at the top of the SmartWRITER screen. The default TAB stops are every 5 spaces.

To change the settings;

Press SK I (Margins/Tab)

Press Sk IV (Tab)

Use the arrow keys to move the tab marker on the rule at top of screen. (The "moving" marker usually indicates the horizontal position of the cursor, but in the TAB adjust mode, it indicates the position of the tab that you are attemptiog to fix at a particular position).

Press SK III (Tab Set) Note: This establishes a permanent tab stop until changed or ADAM is turned off

Press SK VI (Done)

To Remove a Tab Setting

Press SK I (Margin/Tab)

Press SK IV (Tab)

Use arrows key to move the "rule marker" to unwanted tabs

Press SK IV (Tab Clear) Note: one tab at a time is removed in this way.

To remove all tabs, Press SK V (All Clear)

Press SK VI (Done)

CHANGING COLOR AND SOUND

To Select Color, No Sound, Partial Sound, or Full Sound

Press SK II (Screen Options)

Press SK II (Color Select), SK III (No Sound), SK IV (Partial Sound), SK V (Full Sound)

Select personal options and then press SK VI (Done)

NOTE: In all of the "change this or that" modes, pressing ESCAPE/WP will terminate the present operation, and the "mode will return to that which existed prior to entering the "change" mode. To set the changes made in the mode, the mode must be exited via the "DONE", (SKVI), keypress.

ESTABLISHING A RE-USEABLE FILENAME FOR A DOCUMENT

Every time you begin a new file,

type the first sentence and then save your file under a descriptive ten character or less filename,

clear the workspace, and then

GET that new file from the disk or tape.

You must do this or the message "THAT FILE ALREADY EXISTS" will appear and stay there until you press the ESCAPE/WP key when you try to save a document after the first save.

If this confuses you, just remember to type the first sentence, (or even a single letter will do), SAVE the file, CLEAR the workspace, and GET the file back again. Then continue editing the file.

After you have done this, store your file often to avoid retyping your work. (ADAM lockup or power outages are often beyond your control). Press SAVE and SK VI and ADAM stores your file under the existing name. To change the name, type in the new name after pressing SAVE, and then press STORE.

DOCUMENT LENGTH HINTS

Limit documents to approximately seven pages if you have the standard ADAM memory and twenty pages if you have a 64K expander.

You can do more pages with a larger expander (ie 128K, 256K, 512K ect.), but you risk losing a lot of work if something goes wrong, and functions like INSERT begin to take unbearably long time periods to perform.

On long documents, put an END PAGE marker at the end of each file. Combine each file as discussed elsewhere in this chapter.

"NO MORE ROOM/CANNOT WRITE TO THIS FILE" DISASTER

The worst possible problem you can have when you try to save a document; is to not have enough room, or have a bad block on the tape or disk.

When such is the case, SmartWriter will respond with a NO MORE ROOM or CANNOT WRITE TO THIS FILE message and will tell you to hit the ESCAPE key, (Make sure you remove your media before doing this), and then it proceeds to begin "restoring files". The "vertical position of the cursor" marker begins to cycle up and down, and will almost NEVER stop cycling. (Sometimes, if you have the time to wait to see, the cycling will stop after about 15 minutes, and the file will be intact).

The keyboard will "lock" of course, (since the microprocessor is busy trying to follow some program directions, which almost never end with good results to you), and there is no alternative but to reset the ADAM and lose everything you have typed since your last SAVE operation.

To minimize the possibiltiy of such loss, SAVE YOUR FILES OFTEN!!!

You can monitor the amount of space left on your media by doing a "catalog" command in SmartBasic.

Also disks can be checked for "bad blocks" using the VERIFYING function after you format. I know of no way to verify blocks on a tape unless you use some Poblic Domain or Commercial Software, or write a short ML program of your own.

CLEARING UP THE DOS DIRECTORY

To utilize more blocks for data or programs on a tape or disk, consider purchasing some type of squeeze program which removes deleted files from the directory and frees up more space. Remember to SAVE YOUR WORK OFTEN.

SEARCH

Do you want to get to the end of a long document fast? Use the SEARCH function and look for a series of characters that you are sure are not contained in the document (@@@, ###, &&&, ect.), and when ADAM can not find the characters, it will say "CHARACTERS NOT FOUND" and you will be at the bottom of the document. This is much quicker than using the HOME and arrow keys discussed elsewhere in this chapter.

It is impossible to get to the top of your document using SEARCH because ADAM searches only below the cursor, (working from there to the bottom of the file). If you want to get to the top of a document, it is sometimes quicker to SAVE your work, CLEAR the workspace, and reload the file. This is more true when you have a long file, and/or are using a disk drive.

Sometimes SEARCH has a problem searching past END PAGE markers. Remove them if they cause you problems while you are using SEARCH.

SEARCH can be used to check spelling on a word that you think as an afterthought that you may have spelled incorrectly. In the SEARCH mode, just type in the first few letters of the word and begin the search. When you get there, check it for accuracy, and move on to your next task.

SEARCH and REPLACE can be used to put in unique words and/or phrases that are either to be repeated often and you tire of typing the same thing over and over, (like a company name or something); or the spelling of which you are unsure at the time and you don't want to stop and verify it.

Type in an abreviation of your own choosing, or a code that you can use later as something for which to SEARCH.

After you are through editing the file, search for the code and replace it with the thing that you wanted in the first place. Use SEARCH and REPLACE ALL to do it in one pass, automatically.

DO YOU HAVE THE LATEST REVISION?

To get the revison number of the SmartWRITER ROM in your ADAM,

before you press the ESCAPE/WP key to enter SmartWRITER,

press the Control Key and the R Key simultaneously and the number R80 should appear in a new Smartkey Block IV on the screen.

If you have a lower number, you should contact a hardware vendor and purchase an R80 version, because earlier versions have numerous bugs. Also some co-ordinating programs will not work with earlier versions. (See the advertiser pages and "IMPORTANT NAMES AND ADDRESSES" in this ASG).

You can also temporarily update Smartwriter's revision level by using the DISK MANAGER software that comes with disk drives. The software contains R80 versions of Smartwriter. Once loaded, press ESCAPE/WP key, and the latest version will be installed. You must do this at the beginning of each session, because when you turn ADAM off, the information is erased.

However if you get a new hardware update, as suggested above, the change is permanent.

UNDERLINING RULES

Remember these rules when underlining:

Do not set the left margin to one

If the left margin must be set to one and the line follows a blank line, do not start any underlined text in column number one. Start the underlined text in column two or greater.

If the left hand margin must be set to one and underlining must start in column one following a blank line, then make the preceding line "un-blank" on the screen, (but still blank to the printer), by;

placing a Control plus 6 plus a space, (plus the usual return);

or place a SUB/SUPERSCRIPT plus a SUBSCRIPT and a space, (plus the usual return).

This will also cause Smartwriter to skip only one line at each blank line instead of the normal 1 1/2 lines when printing, (probably its most infamous bug).

CARRIAGE RETURN BUZZ

If you attempt to place a carriage return at the end of a line at the end of your document, and you hear a buzzing sound; it means that there are characters to the right of where you are trying to put the carriage RETURN. (These characters may be spaces, tabs, or control plus another key, etc.; (which characters are not visible on the screen).

To solve this problem, you can advance the cursor to the right a few spaces and then press the BACKSPACE key a few times and then press the carriage RETURN.

Another solution is to use the INSERT key to put the carriage RETURN where you want it; as you would if you were inserting any character anywhere in the document. But avoiding the INSERT function in long documents is always desireable when you can, because the function take a long time in SmartWRITER.

PAGE NUMBERING PROBLEMS

To get the correct pagination, (page numbers), store the first page of your document in a separate file by itself. Then you can print your file out with no page number on page one, and begin page numbering with page two.

DELETE VS CLEAR

If you need to delete a section of a saved document, always use the DELETE key and not the CLEAR key. DELETE allows you to continue using the original file name while clear makes you type in a new name.

BACKSPACE - LEFT ARROW - UNDO

If you need to backup and retype over an error, use the left arrow key and not the BACKSPACE key. If you press BACKSPACE and then the UNDO key, (what ought to be a legitimate operation), your ADAM will often lockup.

RE-ALLIGNMENT OF TEXT

If you use your backspace key instead of the DELETE key, (in the process losing the alignment that was established when you originally typed the text), you can get everything to line up again by pressing the INSERT key and the SE LF (Done). This is the fastest way to do it, and it should be re-aligned so that there will be no annoying gaps in your text. DELETE can also be used to realign text, but this function involves highlighting text to be deleted.

MORE ABOUT CARRIAGE RETURNS

If you are entering data and want it to be in a certain spot, you must have a carriage RETURN at the end of the line to "hold" the line in place.

Also if you want to indent a line, the previous line must have a carriage RETURN at the end of it.

STOP ADAM PRINTER PAPER FROM SLIPPPING

A good method to use to stop paper from slipping in the printer is to remove the printer cover and place one 3 inch, (3 inches unstretched), rubber band on both the right and left side of the cover. Replace the cover and lift each rubber band to stretch over the tabs that stick up on the paper hold down bar. Lift the rubber bands when the bar must be raised for paper adjustment.

DISK DRIVES

Smartwriter recognizes only one disk drive. Do not try to utilize the second disk drive if you have one. Smartwriter will not recognize your disk drive unless you turn it on before you turn ADAM on.

END OF FILE INDICATOR

ADAM adds one extra extra carriage RETURN when a file is saved to tape or disk and removes it when the file is retrieved. ADAM uses the extra carriage RETURN as an END of FILE locator in case no data was entered, as in the case of a dummy file. This may be another reason ADAM may sometimes scramble text at the end of a long file.

LOCK-UP OF ADAM SMARTWRITER PROGRAM

If you attempt to clear the workspace and hit the keys too quickly, you can lockup the system or the sound will disappear. When this happens, save your document, turn your ADAM off and back on to the default settings. To prevent this from occurring, just wait a second between hitting the keys required to clear workspace.

As mentioned above, pressing BACKSPACE then UNDO may lock up the program.

On occasion, when you seem to be locked up, removing the keyboard connector, (from the ADAM or the keyboard), will unlock the ADAM.

VERTICAL MARGIN - PAPER SIZE INDICATOR

The 11 or 14 above the vertical margin scale tells you if you are working on paper size 8 1/2 X 11 or 8 1/2 X 14).

SMARTWRITER TO SMARTBASIC

Can you make Smartwriter accessible to SmartBasic? Start with SmartBasic and create a dummy file. To create a file accessible to Smartwriter and SmartBasic, it must be an "A" type. You can create such a file by writing and implementing the following BASIC program.

```
10 REM  A FILE CREATOR
20 PRINT CHR$(4); "OPEN SAMPLE"
30 PRINT CHR$(4); "WRITE SAMPLE"
40 PRINT
50 PRINT CHR$(4); "CLOSE SAMPLE"
60 END
```

After running this program, the file name SAMPLE may be edited via Smartwriter and saved. It will save as an "A" file because it was read as an "A" file. It then contains data readable by SmartBasic. If your sentences are too long, you can not use the BASIC "INPUT" statement. In such cases, you will have to use the BASIC "GET" statement.

GUESSING THE SIZE OF A "LOADING" FILE
When you are GETting files from tape or disk, watch the white marker on the left scale. Each sweep of the marker as it scans from top to bottom is equal to one page, (not screen but page), of text.

BOLD TYPE FACES
Bold Typing parts of text is possible with the original ADAM Printer. First print the text. Now return the sheet of paper to the beginning of the text (use the knurled knob on the printer). Press HI-LITE and mark all the text to be typed as boldface. If you need to skip lines between bold typing, you must tell ADAM by HI-LITING at least one space per line to be skipped. Press PRINT and then PRINT HI-LITE.

Experiment to perfect.

A LABEL MAKER
Here is a Lable Making Process that only works in Smartwriter.

Press SK I (Margin/Tab)

Press SK II (Horizontal Margin)

Press Sk III (Left)

Use left arrow to take margin to one

Press SK VI (Done)

Now enter your data. Anywhere you need a blank line, including the space between lables do the following:

Press SK VI (Super/Subscript)

Press SK V (Subscript)

Press the Spacebar once

Press SK VI (Done) followed by a RETURN

An easy way to repeat the subscript character throughout the list of addresses is to make up one subscript character and then use the COPY function to repeat it throughout the list.

GAME CONTROLLER INPUT
The controller keypad can be used to input numbers and the joystick can be used to move the cursor in Smartwriter.

MORE DIRECTORY DISPLAY WHEN DIRECTORY SCREEN IS FULL
When the first directory requested fills the screen completely, SmartWRITER has displayed only the first part of the directory. To see the rest of the directory, (if there is indeed any more), do the following: Move the arrow to the bottom right file name and press the down arrow. The drive will run to load the second part of the directory.

LARGER DIRECTORIES MAKE MORE FILES STORABLE
The first block of the directory allows the user to store 35 files, (main and backup included). Each additional block allows an additional 39 files to be stored. The default number of blocks to save for directory purposes when using the INIT command in BASIC is one!

To create your own two block directory, LOAD SmartBASIC and POKE a 2 into location 25388 in the BASIC immediate mode: (POKE 25388,2 followed by a press of the RETURN key). Then INIT your datapack or disk according to the instructions in your "BASIC PROGRAMMING MANUAL".

(Any number from 1 to 127 can be poked into location 25388. But one must evaluate how large the files are likely to average, relative to the number of blocks there are on the media; in order to make a good guess at how many blocks he should save for his directory).

DELETING FILES
You can delete files on a media when in Smartwriter, whether you are editing a file or just barely have changed from the electronic typewriter.

First press the GET key and move the arrow to the file to be deleted.

Then press the DELETE key. Presto it is gone from the directory. **BE CAREFUL!**

PRINTING TIPS
Always save your document before you try to print it. On rare occasions, ADAM may lockup and not allow you to save your work. (on even more rare occasions it may lock up when trying to save, as explained above).

When printing a document, the last line of the document will not print unless there is a carriage return at the end. Put in one or two just to make a good habit out of it. One press of the RETURN key only adds two bytes to the file length.

REVERSAL OF UNWANTED COMMANDS
Use the UNDO key to reverse any unwanted commands such as CLEAR. Press UNDO immediately before you press any other key.

"BUT TAKE CARE WHEN PRESSING BACKSPACE AND UNDO!!!

Bill Reynolds

SMARTBASIC Ver 1.0

by Guy Cousineau

ADAM's SmartBasic was advertised as being APPLE compatible. What this means is that you can take an APPLE program without any PEEK's and POKE's in it, type it in, and run it on the ADAM with much the same results. In other words, the SYNTAX is compatible.

A few sacrifices were made in using this approach; they will be explained under each subject heading below.

If you are not familiar with BASIC programming, you may find some good books in your local library. Any beginner's BASIC book should help you get started.

In this chapter, we will cover each BASIC command or function. For each one, you may discover some undocumented syntax, ways to utilize commands more effectively, or ways to improve on their performance.

Throughout the chapter you will see sample program lines as illustrations. These are often taken out of context and illustrate only a portion of a program that accomplishes some task. The section extracted is so done in order to illustrate the subject under discussion.

Subjects have been organized in the following related groups and generally flow from simple to more complex:

PAGE	TOPIC	COMMANDS
1	Looping	NEXT FOR
	Branching	GOTO IF ON GOSUB RETURN POP
	Input	INPUT READ DATA CLEAR GET RESTORE IN PP INT
	Output	PRINT PR
	Format	HOME FLASH INVERSE NORMAL TEXT SPEED
	Position	HTAB VTAB POS VPOS TAB SPC
	Misc.	DIM DEF LIST DEL
	Joystick	PDL
	Lo-Res	GR HLIN VLIN PLOT COLOR SCRN
	Hi-Res	HGR HGR2 HCOLOR HPLOT ROT SCALE DRAW XDRAW
	Control	STOP END NEW RUN TRACE NOTRACE CONT
	Error	ONERR CLRERR RESUME ERRNUM BREAK NOBREAK
	Ram	CALL POKE WAIT HIMEM LOMEM USR & FRE
	String	LEFT$ RIGHT$ MID$ LEN STR$ ASC CHR$ VAL
	Math	INT ABS SGN LOG SQR EXP TAN SIN COS ATN
	Random	RND
	Logicals	AND OR NOT = <> > < >= <=

As this is a preliminary chapter on SMARTBASIC, there will be no discussion of FILE related commands like CATALOG, OPEN, READ, etc.

LOOPING

Looping is a method of repeating a group of instructions several times; it helps reduce the number of program lines required for a task. Following are all valid ways to start a loop:

```
FOR x=1  TO 10
FOR x=a  TO a+b
FOR x=10 TO 5 step -1
FOR x=x to 100
```

Note in the last example that the loop assigns its "start value" to the variable which is used as the loop counter; that's OK and really no different than " x=x+1 ". Consider the following program:

```
10 FOR x = 1 TO 10
20 PRINT x
30 NEXT x
```

As you would suspect, the program would print the numbers 1 through 10 and then stop. X is used as a counter by the BASIC program and the NEXT X instruction returns control to line 10 until such time as X is greater than 10. But what if I want to print even numbers from 10 to 20?

```
10 FOR x = 10 to 20 STEP 2
20 PRINT x
30 NEXT x
```

Note the new STEP instruction in line 10. It tells the program to increase the value of X by 2 on each pass.

The STEP instruction can be any positive or negative real number: -3.2, +3.66, .001, are all valid values, you can even use a variable!

Note that the STEP instruction is optional and a default value of +1 is assumed if no STEP is given on the FOR line.

Say you want to print a multiplication table for values from 0 to 5. Here you need 2 loops, a loop NESTED inside another loop:

```
10 FOR x = 0 TO 5
20 FOR y = 0 TO 5
30 PRINT x*y
40 NEXT y
50 NEXT x
```

Note the large loop which extends from line 10 to line 50, and the smaller NESTED loop from line 20 to line 40. The second loop will run for values of Y from 0 to 5 and then fall through to the X loop which will ask to repeat the Y loop one more time.

It is not generally necessary to specify the variable name when giving a NEXT command. BASIC keeps track of the CURRENT loop and will execute it automatically.

Furthermore, NEXT instructions will actually run FASTER if no variable is supplied. The multiplication table routine could therefore be written as:

```
10 FOR x = 0 TO 5
20 FOR y = 0 TO 5
30 PRINT x*y
40 NEXT
50 NEXT
```

If you have several nested loops, giving "umpteen", and that is a whole bunch, NEXT instructions may get tedious and take up valuable program space. There is another alternative: put your NEXT instructions in one command:

```
10 FOR x = 0 TO 5
20 FOR y = 0 TO 5
30 PRINT x*y
40 NEXT y,x
```

This program will run just as the others, albeit a trifle slower because the y and x are specified.

The instruction on line 40 means DO A NEXT Y UNTIL THERE ARE NO MORE THEN DO A NEXT X. Note that if the variables are specified, it is very important to specify them in the correct order.

What if you want to break out of a loop? Let's go back to the table above. Say I want to print my multiplication table just for results that are smaller than 10....

```
10 FOR x = 0 TO 5
20 FOR y = 0 TO 5
25 IF x*y>9 GOTO 50
30 PRINT x*y
40 NEXT y
50 NEXT x
```

Note the new line 25 which branches the program to the NEXT X instruction.

You don't have to worry about leaving the NEXT Y loop open since SMARTBASIC and most other BASICs will automatically terminate the 'y' loop when it encounters the NEXT X instruction which is higher in the shell.

Note that when using this technique you must always specify the variable name in NEXT statements.

Use this approach only with extreme caution; it is very easy to get all tangled up.

Furthermore, if you jump completely out of the outside loop without closing it, it will remain on the stack and may eventually overflow.

BRANCHING

IF

"Decision making" is a very important part of BASIC programs and is often the cause of tedious gymnastics. The IF statement precedes most decisions. It is followed by a mathematical or logical statement which can be simple or very complex:

```
IF x
IF x = 2
IF x^2 >= 2*(y+z)
IF x=2 AND y=3
```

When BASIC encounters an IF statement it evaluates the expression on the left and compares it to the expression on the right.

If the condition is TRUE, the rest of the line is executed.

If the expression is FALSE then the rest of the line is ignored. Note in the first example that there is no expression on the right; it is evaluated as X NOT EQUAL TO 0. The IF statement is followed by THEN and another statement. Let's say I want to make sure that x is never bigger than y:

```
IF x > y then x = y
```

Note that IF THEN works on the rest of the physical line and not only on the rest of the statement:

```
IF x > y then x = y : x = 5
```

In the line above, x will be set to 5 ONLY when x>y. This approach can help simplify programs and reduce the amount of jumping around required to determine which routine to execute

next. In those cases, the IF statement is followed by GOTO:

```
100 IF x = 1 GOTO 150
110 IF x = 2 GOTO 200
120 IF x = 3 GOTO 250
130 GOTO 300
150 y=5
160 GOTO 300
200 y=22
210 GOTO 300
250 y=77
300 more program
```

When using IF...GOTO the THEN is not required and actually executes faster than IF...THEN GOTO. However, IF...THEN can also be used to branch just as well as IF...GOTO. That is to say, in the example above the GOTOs could as well be replaced with THENs.

However, the example above shows how programs can become needlessly complicated. Look at the following version of the same decision routines:

```
100 IF x=1 then y=5
110 IF x=2 then y=22
120 IF x=3 then y=77
300 more program
```

Let's consider something a bit more complex like MENU decisions. Assume we have 5 major functions which are selected by entering a number from 1 to 5. Here's where ON...GOTO can come in handy. An ON statement looks up a list of line numbers and decides which one to use based on the DECISION variable:

```
ON x GOTO 100,250,375,465,555
```

In this example, the program will jump to line 100 when x=1, to 250 when x=2, and so on.

What happens if x is greater than 5? No jump is made and the program falls through to the next instruction.

Depending on the application, you may want to trap ILLEGAL selections immediately after the ON GOTO. ON works on INTEGER values only and it starts at a value of 1.

The ON statement can be followed by a complex mathematical formula:

```
ON INT(x/3)+1 GOTO 100,200,300,400,500
```

Note also that ON...GOTO will continue with the next statement (not the next physical line). For experienced programmers, this can be used instead of IF...GOTO to concatenate several lines together even if decisions are required. Consider the following line:

```
ON x=2 GOTO 500 : y=y+5 : GOTO 700
```

Here, a jump is made to line 500 whenever x=2 (just like IF...GOTO). However, when x<>2, the rest of the line is executed (unlike IF). Note that when 'x=2' is true, a value of 1 is returned thereby executing the first jump in the list; when the expression is false a 0 is returned and no jump is made.

GOSUB

SUBROUTINES can help reduce program size by executing repetitive functions from a central location. Say you have a MONEY program that prints Dollars and Cents. You spend considerable time developing a technique for right-aligning your figures etc. You will want to access this routine from various areas in the program. What you do is set up the routine at line 1000:

```
999  REM print x in dollars and cents.
1000 ...routine
1399 RETURN
```

The routine ends with RETURN which marks the end of the subroutine. Whenever you want to use the routine, you just place the required value in x and GOSUB:

```
150 x=123.45
160 GOSUB 1000
170 more program
```

GOSUB can be nested inside a program line; the RETURN instruction will go back to the NEXT statement in the line:

```
150 x=123.45:GOSUB 1000 : x=y/2 : GOSUB 1000
```

The line above will do what you expect: It will first print $123.45, followed by one half of the value of y.

Note also the REM statement BEFORE the start of my subroutine. It is a good idea to remind yourself what a routine does and how it does it. This can be indispensable later on when changing your program; don't let a failing memory disable your programs.

Note also that the REM statement is PRIOR TO routine and not the first statement in the routine itself. This technique will help make your programs run faster since the REM statement does not need to be read, (and then discarded), every time the routine is executed.

In some cases, you may want to abort from a subroutine to go elsewhere. Say I am using the routine above to show how much money you have left in a game. If you ever run out of money, I want the program to exit. Here's where the POP instruction comes into play. See the following routine which demonstrates its use:

```
999  REM print x in dollars and cents.
1000 IF x<=0 GOTO 1100
1020 ....
1100 POP
1110 PRINT "no money left"
1120 GOTO 100
```

The POP instruction at line 1100 tells BASIC to discard the RETURN address it had stored. Program control is returned to line 100 where you might check scores, ask to play again, etc.

It is essential to POP correctly to maintain all of your pointers for the same reasons that using GOTO in a subroutine which terminates with a RETURN statement, will result in a "RETURN WITHOUT GOSUB" error statement.

Remember IF and ON above? They can also be used quite effectively with GOSUB as well:

```
IF x=3 THEN GOSUB 1000: y=4 :?"Hello"
ON x GOSUB 1000,2000,3000 : Print x+y
```

In the first example, the GOSUB instruction will be executed only wheo x=3; upon RETURN from the subroutine, the rest of the line will be executed.

In the second example, the subroutine calls will be made for x=1 x=2 and x=3; for any value of x; the x+y value will ALWAYS be printed since the RETURN from ON GOSUB comes immediately after the line number list.

GOTO (Line#) can be used in immediate mode to re-enter a program that has crashed or aborted with ^C. Note that the line number chosen must NOT be inside a loop or in a subroutine.

GOTO (Line#) can also be used to enter a program that has not yet run too; but such an operation would be useless and perhaps disastrous if the entry line were one in which further operations were dependent upon values which should have been calculated in the program prior to the execution of the line chosen to enter.

However, when writing a program, screen presentations are easily checked by this method; if a GET:STOP statement is placed at the end of the command lines defining the screen.

One interesting patch allows formulas in GOTO or GOSUB:

```
10 FOR x=0 to 7
20 READ y
30 POKE $342+x,y
40 POKE $437+x,y
50 NEXT : END
60 DATA 0,0,0,205,3,39,68,77
```

Line 30 installs the patch for GOTO and line 40 for GOSUB.

What the patch does is to replace the routine that gets a NUMBER from the command line with a routine that evaluates an EQUATION from the command line. After making the patch you can use:

```
100 GOTO 10*x
200 GOTO (3*x+100*y)/3...etc,
```

whereas without the patch, variables were not valid as the "object" of a GOTO or GOSUB command.

INPUT COMMANDS

INPUT

INPUT can be used to let the user enter a string, or a numerical value to the program from the keyboard.

(A string is a word or words, whether composed of numerical or alphabetic characters, or a combination thereof).

It also has the optional capability of printing a message which will be referred to as a prompt.

```
INPUT x
INPUT y$,z$
INPUT "name: ";n$
```

The above are all valid versions of INPUT commands. The first requests a numerical value, the second asks for 2 strings, and the third prints a prompt then asks for a string.

Note that BASIC will not allow you to respond with a string at the first prompt and will give you a nasty re-enter message if you do.

Note also that there is a space after the colon in the prompt in the third example. Remember that SmartBASIC will not automatically add a space after a string prompt, and you should provide adequate spacing yourself. Otherwise the entry from the keyboard is this case would be pressed right up against the colon. It makes for a much better presentation to leave a space.

Note also that when entering a string from the keyboard, it is not necessary to place the string in quotes unless the string includes a comma, (,).

A quote character (") can never be part of a string entered at the keyboard.

INPUT is not buffered. This means that you can't supply values ahead of time for other inputs that will follow. Try the following program:

```
10 INPUT x
20 INPUT y
30 PRINT x,y
```

When you run the program, type 1,2 at the first prompt. BASIC will respond with an 'Extra Ignored' and re-prompt (at line 20) for another input. This is a minor error which only means that you supplied more values than you were asked for by the command being executed. The "1" was accepted, the "2" was rejected.

GET

GET is handy for MENU-TYPE applications when you want to get only one character without having to also hit the RETURN key, as was necessary with the INPUT command.

Consider the folowing:

```
10 PRINT "Continue or Quit (c or q)"
20 GET k$
30 IF k$="q" then end
40 IF k$<>"c" goto 10
50 more program
```

In the example above we expect the user to respond with either "q" or "c".

Note that contrary to INPUT, GET cannot be preceded with a prompt. Any prompt would need to be supplied via a regular PRINT statement.

GET can handle any key press including the SMART KEYS, SPECIAL KEYS, and even CONTROL-C without affecting program execution. A program that uses GET's instead of INPUT's allows more flexibility and cannot be CRASHED by incorrect input.

If you consult a table of keyboard codes, you can make use of the values returned by MOVE STORE PRINT CLEAR etc to handle menu options. The following example is not the most effective use of this approach but illustrates the concept:

```
100 GET q$
110 q=ASC(q$)
120 a=0
130 IF q=146 THEN a=1 :REM MOVE/COPY
140 IF q=147 THEN a=2 :REM STORE/GET
150 IF q=148 THEN a=3 :REM INSERT
160 IF q=149 THEN a=4 :REM PRINT
170 IF q=150 THEN a=5 :REM CLEAR
180 IF q=151 THEN a=6 :REM DELETE
190 ON a GOSUB 1100,1200,1300,1400,1500,1600
200 GOTO 100
```

The routine above sets values of the variable a, based on the 6 function keys on the right of the keyboard. An ON GOSUB instruction is used to execute the appropriate routines.

Note that in this particular case, subtracting 145 from the value of q would have worked as well, but you might have also wished to evaluate the values for UNDO HOME etc. which do not have consecutive values.

When using GET to input numbers only, it is interesting to note that the GET function accepts NUMBER-PUNCTUATION such as " . + - e E ". This can lead to interesting gymnastics on the programmers part...try writing a routine that will use GETs to correctly receive a number such as +3.67E-12 or -365.42.

DATA

DATA is a handy way of providing reference information to programs. DATA statements can include numbers or strings:

```
1000 DATA 1,2,3,4,5
1010 DATA Guy Cousineau, "Hi, My name is Guy",Ottawa
```

The first example contains 5 numbers; how many string elements in the second line? The correct answer is three. The space between "Guy" and "Cousineau" will be included in one string containing my full name. The second string is enclosed in quotes since it contains a comma.

The routine that PARSES a DATA line is the culprit of the DATA/REM bump bug. Every time you load in a program that has a DATA or REM statement in it, an extra space is added. This can eventually push your DATA off the end of the line...oops. Ah well, too bad!

Hope, just fix this PARSE routine with the following:

```
POKE 15830,8:POKE 15831,55:POKE 15832,19
```

****

(Editors Note: There are several good utility programs which install these "fixes" permanently to your SmartBasic program media. For a good copy of one of the best, contact your user group).

****

READ

READ is used to take the DATA statements' information out of the "DATA" part of upper Basic RAM, and make it equal to variables that you specify. Using the example above to illustrate, my program might start with:

```
10 READ a,b,c,d,e
20 READ me$
30 READ hello$
40 READ city$
```

See how it is not necessary for the line number of the DATA statement to precede the line number of the READ statement.

Note that READ will start at the first DATA statement in sequence and continue forward until there are no more. (That is to say, in this example the a=1, b=2, c=3, d=4, e=5, me$="Guy Cousineau", etc.

You may have encountered the OUT OF DATA message; it simply means that you have tried to READ more DATA than there is in the program.

Note also that it is very important to read the data in the correct order and also,

not to try to READ a string data into a numerical variable or you will get another nasty message.

CLEAR

CLEAR resets all variables to zero and resets DATA pointers. CLEAR is in this fashion used as a trick by some programmers to prevent you from analyzing a program after it ENDs.

It can be handy during a program-restart operation to clear all variable values. For example, in a game situation, rather than use tedious assignments like:

```
1000 a=0:b=0:c=0:d=0
1010 q=1:r=2
1020 GOTO 100
```

You can replace 1000 with CLEAR which resets all variables to zero and then fix only the ones that should not be 0.

RESTORE

RESTORE affects only DATA statements. No variables are cleared with RESTORE!

The command resets the pointer to the current data element back to the beginning of the program.

IN

IN lets you branch program control to another routine which handles all keyboard requested input. These are very complicated and require a thorough knowledge of the BASIC operating system. I am not aware of any routines available for use with IN.

FP AND INT

FP and INT were added to be APPLE compatible. Some BASICS allow you to specify if your program is using FLOATING POINT or INTEGERS for input. Since SMART BASIC has implemented this function in a different fashion, the only thing that these commands do is change the system prompt from ']' to '>' and vice-versa. Integers will be the subject of another discussion.

OUTPUT

Odd as it may seem, there is only one way to send out anything from a BASIC program: that is by use of the PRINT statement. It is, however, a very versatile and capable command, as shown by the examples below:

```
PRINT "hello"
PRINT a$,b$
PRINT a;" dollars and ";b;" cents"
PRINT x^2+5*y
```

The comma is used to cause the character specified behind it to print on the next half of the screen, and can be used to neatly format data in 2 columns.

Consider the following program:

```
10 FOR x=1 to 10
20 PRINT x,2*x
30 NEXT x
40 END
```

As you have already figured out, it will print a 2's multiplication table. But when you run this program, you will notice something peculiar about the print-out, which is as follows:

```
1       2
 2      4
 3      6.....etc.
```

All but the first line are indented by one space. This is a result of the arithmetic used to determine if you are in the first column. You can solve this problem by adding:

```
5 PRINT " ";
```

The semicolon ";" is used to concatenate several items on one line. In this case, it concatenates the first printed character to a space. Thus column 1 is a space, and the "1" appears in column 2, as do the "2", and the "3".

To change the comma spacing from 1/2 screen to 1/4 screen, make the following changes:

```
POKE 7879,7: POKE 7881,8        and to restore
POKE 7879,15:POKE 7881,16
```

PR#n

The PR command is used to select device output. Similar to IN, this command accepts up to 8 devices with all but PR#1 being the same with Basic as it comes with the new ADAM. The command sets a flag to channel output to an external device (eg the printer).

SCREEN FORMAT COMMANDS

HOME

The HOME command is used to clear the text window (even the 4 lines of text in GR and HGR mode). It also places the cursor in the top left corner of the screen. If you want to home the cursor without clearing the screen, just type "PRINT CHR$(128)" on your Basic screen, and press RETURN.

SPEED

SPEED controls the time delay between each character sent to the screen. It does not affect the rate at which keypresses appear on the screen).

It is useful during "de-bug" operations when one watches the TRACE function to see where branching is taking place. It allows the line numbers to apear on the screen slowly enough for the eye and mind to follow.

It can also be useful for special effects but should generally be avoided as it infuriates some experienced programmers, fast readers, or anxious game players. Don't try to guess how fast someone can read, fill up a screen and GET a keypress to move to the next screen. You can totally disable SPEED with:

```
poke 12043,195:poke 12044,15:poke 12045,76
```

Note that these 3 POKEs must appear on the same Basic command line or BASIC will crash.

FLASH AND NORMAL

First we will explain a little about the special memory in the ADAM which is reserved for the exclusive use of the Video Data Processor, (VDP). This is referred to as VIDEO RAM, or VRAM.

VRAM contains the pattern definitions of the characters which may be selected to be printed on the video screen. The table containing these definitions is called the Pattern Generator Table. The pattern definitions or "pattern generators", are composed of 1's and 0's. For example, the pattern geoerator for the "space" character would be all zeroes.

(It is ultimately the responsibility of the programmer to create these pattern generators and load them to the Table, and the Smart Basic programmers and OS7 programmers have long since taken care of that problem inasmuch as the standard ASCII characters are concerned).

These pattern generators all have names. The first one in the VRAM Pattern Generator Table is named "0", (that is it's name no matter what the character my look like), the second is named "1", and it should not take too much imagination to figure out that the third is named "2", etc.

VRAM also contains a Name Table.

There are, when Basic is in the "Basic Text Mode", 32 columns and 24 rows of pattern positions defined for the video screen, or a total of 768 pattern positions. Thus there must be in the Name Table, 768 name positions. And so there are.

Any one of the 256 Pattern Generator Table names may be placed in any of the Name Table positions. When a name is placed in one of the Name Table positions, the Video Data Processor, (which controls the actual display), finds the named pattern in the Pattern Generator Table, and displays that pattern on the screen, in the screen position corresponding to the Name Table position where the pattern name was placed.

Thus if pattern name 65 were placed in Name Table position 0, and if the named pattern showed the letter "A", an "A" would appear in the upper left corner of the screen.

Ah, you say, but what would be the color of the character,

(the 1's), and the background, (the 0's)? And so on we go!

You see, VRAM also contains a table which defines the color of each pattern position on the screen. This is referred to as the Color Table.

There are then, 768 color definitions in the Color Table, one for each pattern position on the screen. And each Color Table entry corresponds to a Name Table entry. That is, Color Table entry 0, defines the color of the pattern which will be named in Name Table position 0. (Thus one might be able to have quite a kaleidescope of colors on the screen, with a little imagination).

Each of the 768 Color Table entries is one byte in length. The top half of a byte of any particular Color Table entry, (or upper nibble); defines the color of the 1's for whatever pattern you may decide to put in the corresponding position in the Name Table.

Thus, to continue the above example, if the name placed in Name Table position 0 were a 65, and the pattern in the Pattern Table were an "A", and if the color in the Color Table position 0 were defined as blue 1's, and white 0's, the letter "A" would appear in the upper left corner of the screen, as blue on white.

When Smart Basic is loaded it creates 2 Pattern Geoerator tables in VRAM instead of the required one table. These two Pattern Generator Tables are almost identical, under normal circumstances. (Again, this is not a required part of ADAM's VRAM, but is the way that Smart Basic, and some other Coleco software programs, create some special effects).

The Smart Basic program routinely switches video control back and forth, from one of these two tables to the other, regardless of the FLASH, INVERSE and NORMAL settings.

Under NORMAL conditions the two Pattern Generator Tables are almost identical as stated above. However the cursor Pattern Generator is an "underline" on one table, and a space character, (clear), on the other. Switching between the two tables is what makes the cursor appear to be blinking on the screen.

FLASH

When FLASH is in effect, then any character written during "FLASH" will be defined in one of the two Pattern Generator Tables as the reverse of the definition in the other table.

That is, wherever in the pattern definition there are zeroes in the normal Pattern Generator of that character in the first Pattern Generator Table, there will be ones in the Pattern generator Table and vice versa.

And thus, by BASIC switching between the two tables, the video display makes the character appear to reverse colors with each switch. Thus the character and its background appears to be changing, or "FLASH"ing. It is actually two different characters, one the reverse color of the other, being displayed alternately on the screen.

When FLASH is removed by NORMAL, the characters in both tables remain as they were, and flashing characters continue to flash. But new characters written when FLASH is not in effect, are defined the same way in both tables, and even though there continues to be a changing of the screen, it is not seen wherever the characters in both tables are identical.

Thus it is that some characters will flash, and others will not.

You can modify the FLASH speed by POKEing different values into address 159, (009FH); the default value is 12.

Address 17291 (438BH) contains the wait value for the cursor flash; the default value is 4.

INVERSE

If INVERSE is on, then whatever character is printed during that condition, (that is, whatever Patttern Generator Name is placed into the Name Table during that time), the color in the corresponding Color Table positon will be changed to have the low and high nibbles reversed. Thus the color of the character of that screen position will be reversed from the normal.

Since here the Color Table is used, and inasmuch as there is but one Color Table, no flashing will occur.

In this way Basic controls the VRAM Tables to create the INVERSE colors of any character on the screen.

When writing directly to Video Ram while Basic is running, if addressing the Pattern Generator Table, you must write the new character into both tables if you don't want to get funny results.

INVERSE can be handy for printing TITLES at the top of the screen. Note that INVERSE will print regular characters in inverse video and inverse characters in normal video:

USING FLASH AND INVERSE

FLASH is used for emphasis. Depending on the colour selection, it can be very hard on the eyes. For this reason, it should be used sparingly and for short periods. The

following program illustrates a good combination of FLASH and INVERSE for emphasis:

```
10 a$="    HEADLINE    ":REM your message here
20 HOME: FLASH: PRINT a$
30 FOR w= 1 TO 1000: NEXT: REM wait a bit
40 HOME: INVERSE: PRINT a$
50 NORMAL: PRINT "continue"
```

TEXT

TEXT is a very powerful command. In addition to being used to exit graphics modes, it can be used to clear or set certain other screen parameters. You can patch in your default TEXT attributes as follows:

17054	42BE	border colour
17060	42A4	background colour
17115	42DB	normal character colour
17126	42E6	inverse colour
17164	430C	character to fill the screen with
17175	4317	character to fill alternate screen
17198	432E	number of lines
17199	432F	number of columns
17201	4331	home line number
17202	4332	home column number

Every time you give a TEXT command, it is reset to the values in the addresses shown above. Be sure these values are the ones you want to live with. To temporarily reset the margins, POKE the values you want in the following addresses; you can then reset using TEXT.

16993	4261	number of lines
16994	4262	number of columns
16995	4263	home line
16996	4264	home column
16956	423C	left margin
16957	423D	right margin
16958	423E	top margin
16959	423F	bottom margin

SCREEN POSITION COMMANDS

SMARTBASIC has a variety of commands that control the position of the cursor on the screen. Though some may appear similar, each has its own features which makes it different from the rest:

VTAB

VTAB places the cursor on a specific line without affecting its horizontal position. You can use a formula to determine a VTAB position; the equation does not need to return an integer: "VTAB x/3" is valid provided it returns a value between 1 and 24 inclusive. VTAB will select the whole number value of the result.

VPOS tells you where the cursor is. This function seems to have limited value, but I can think of one possible application in a game-type environment. VPOS and HPOS can be used together to form the equivalent to the SCRN function in GR mode. Say your TARGET is at 10,10. You can check if the cursor is there with:

```
IF VPOS(0)=10 and HPOS(0)=10 THEN END
```

Note that VTAB ranges from 1 to 24 and that VPOS ranges from 0 to 23. This is a silly arrangement which could have easily been programmed differently in the creation of Smart Basic, but cannot now be easily corrected.

HTAB

HTAB is similar to VTAB but it places the cursor to a specified horizontal position from 1 to 31. In combination with VTAB it can be used to place the cursor anywhere on the screen.

It can even be used to write outside of the scrolling window. Suppose you have a program that uses the top 2 lines for a title and those 2 lines have been frozen from scrolling (see previous segment on screen commands).

A HOME command will send the cursor to line 3. A VTAB 1 command will, however, send the cursor to the title line and allow you to update it.

If this update sequence is followed by a HOME command, the cursor will be returned to line 3.

If you have a 40-column patch, you may have noticed that you can't HTAB past column 31. This can be partially overriden by POKEing 63 in address 26198 (6656H). This will allow you to HTAB up to 63 (use some discipline here).

Unfortunately the execution routine will still think the right margin is exceeded and you must issue a VTAB command AFTER the HTAB to correct the line number.

TAB

The TAB command will SPACE-PAD between the present cursor position and the new position. This function differs from HTAB in 2 essential areas.

TAB does not back up; if the cursor is at position 15 and you issue a TAB(10) command, the cursor will stay at position 15. TAB also erases the characters between the present and target

positions.

SPC(n);
The SPC(n) function will space ahead the specified number (n), of spaces from the current position.

Note that it must be followed by a semicolon in order to be effective.

SPC differs from TAB in that it always advances and wraps around to the next line if required. It can be handy for right-aligning figures or strings:

The value (n) may be a fixed number or may be calculated.

See the following:

```
10 FOR x=1 TO 6
20 READ x$
30 PRINT SPC(30-LEN(x$));x$
40 NEXT x
50 END
60 DATA all,these,words,are,aligned,on,the,right,
```

POS
The POS function tells you where the cursor is on the line. Similar to VPOS, it returns a number from 0 to 31 (instead of 1 to 32). It can be used for a variety of checks and, in conjunction with other positioning commands, control the position of the cursor, end-of-line-wrap, and screen scrolling. eg.

```
10 DIM x$(10)
20 ?"Input 10 long words"
30 FOR x= 1 TO 10:INPUT x$(x)
40 ?"Now to print them with wrapping"
50 FOR x= 1 TO 10
60 IF POS(0)+len(x$(x))>31 then PRINT
70 PRINT x$(x);" ";
80 NEXT x
```

Line 60 checks to assure that the new word will fit on the current line. If not, the PRINT statement effects a Carriage Return.

Note that we only need to check the length of the new word and don't need to include the space which follows it (in line 70). If that extra space moves to a new line because of the screen wrap, POS(0) will tell us we are on a new line on the next pass. If this seems unclear...type out the program, try it out, and change some of the values.

MISCELLANEOUS COMMANDS

Before starting the more complex subjects, we will cover a few elementary commands which don't readily fit in any other category.

ARRAYS
When you work with arrays (matrices), you must define the size of your array via a DIM statement.

Note that small linear arrays (up to 10) do not need a DIM statement. You can freely use variables x(0) up to x(9). (x(1) to x(10)) would be invalid, inasmuch as the program looks at the actual number in the parentesis and not the legitimate of subscripts actually used).

Yes ZERO is a valid array definition and should be kept in mind when defining large arrays. Say you want to create a 4 by 13 matrix for storing a deck of cards:

```
10 DIM c(4,13)
```

works but actually creates an array of 5 by 14 (0 to 4 inclusive by 0 to 13 inclusive. The number of array elements is 5X14=70 instead of the 4X13=52 required. So what you say? You are using 35% more memory than you really need. A few large arrays combined with a large program can quickly eat up all of your RAM space.

You can define several arrays on the same line with one "DIM" statement, if they are separated with commas:

```
DIM a(23),b(2,12),c(550,d(2,3,8).
```

INTEGER VARIABLES %
This is a good time to introduce INTEGER variables. Ever see a program with lines like c%=a%+2*e%?

The PERCENT sign tells smartbasic that your numbers are signed integers in the range of -(2^15) to 2^15.

When these variables are stored in memory, each takes 2 bytes compared to a floating point number which takes 5 bytes.

Consider the amount of memory required by the following arrays:

ARRAY	HEADER	RAM	TOTAL	DIFFERENCE
DIM a(4,13)	5	350	355	0
DIM a(3,12)	5	260	265	75%
DIM a%(4,13)	5	140	145	40%
DIM a%(3,12)	5	104	109	30%

Not all numbers can be defined as INTEGER variables. The Basic instructions DEF, and FOR require a real variable (floating point) because of the nature of their execution. You can, however change an integer variable into a real one with:

```
a=a%    (both a and a% are different variables)
use a where required
a%=a
now a is free to use somewhere else, and the value is
saved as two bytes.
```

DEF

DEF is used to define a function. Unless your functions are complicated, this is not a recommended approach to programming since it makes program logic hard to follow. Let's take a simple example:

```
10 DEF FN cost(amount)=amount*unitcost
20 unitcost=2.34
30 INPUT "Amount to buy ";amount
40 PRINT "Your cost is $";FN cost(amount)
50 GOTO 30
```

This program starts by defining a function which takes the parameter supplied in brackets (amount) and multiplies it by a fixed variable "UNITCOST". Line 40 could have been replaced with:

```
40 PRINT "Your cost is $";amount*unitcost
```

So why use FN? Say you want to deal out random numbers of a varying range and you want your random numbers to be integer values starting at 1. You might get fed up of typing:

```
INT(rnd(1)*10)+1
```

and occasionally forget a bracket and get a syntax error:

```
10 DEF FN ran(range)=int(rnd(1)*range)+1
20 INPUT "Range ";r
30 PRINT FN ran(range)
40 GOTO 20
```

REM

REM statements are very useful for beginners as well as for advanced programmers who want to distribute copies of their programs.

A REM statement can be used to describe what a subroutine does or the purpose of a particular program segment.

They can also be used to tag program areas where potential bugs exist to remind you where you need to do extra work.

One caution must be remembered. DO NOT 'GOTO' a REM statement!!! At some point in time you may remove some extraneous REM statements and crash your program with an UNDEFINED STATEMENT error. If you have a subroutine at 1000, insert your REM statement at line 999 to describe it.

You will often see programs which start out with several REM statements to describe a program, or issue a copyright notice.

LIST

LIST is used obviously to list out part of your program on the screen (or printer if PR#1 has been used). It has a somewhat loose syntax:

```
LIST          list everything
LIST 100,200  list from 100 to 200 inclusive
LIST 100-200  as above
LIST 100-     list from 100 to the end
LIST -200     list everything up to 200
```

To pause a long list, you can use CONTROL-S. You can resume the list with any key press even CONTROL-S. It is easier for clumsy typists to tap the CONTROL-S several times to start and stop the list.

Note also that LIST can be used within a program....think of a use for it.

DEL

DEL is used to delete a line number or a range of line numbers; it uses the same syntax as LIST. Do not confuse it with DELETE which is used to delete a file from tape/disk. (Del and Delete can also be used within a program, so take care).

Consider the following situation:

```
10 PRINT "Please wait"
20 LOMEM:30000
30 PRINT CHR$(4); "BLOAD data"
60 PRINT "Program Ready"
```

This program starts by loading some data from file and then proceeds to execution. What if the program crashes and you have to type RUN to start again? You will have to wait those several extra seconds while the data loads back in again. Why not add a few more lines:

```
40 DEL 30
50 REM line 30 PRINT CHR$(4);"BLOAD data"
```

That way, if the program crashes, you can re-enter quickly with RUN. If it crashes badly enough that you need to reload the data, you can check out the name of the data file with LIST 50.

In fact you can "LIST" line 50, cursor through the part of the statement which begins with the "30 ...", and after passing through to the last of the line, press RETURN.

That operation places line 30 into the program again, and a "RUN" statement will do the whole thing as if you had reloaded the program from the media.

If you use this technique, be sure that line 30 is really there before you save the program to tape or disk.

You don't need to use DEL to delete one or 2 lines, just type the line number to delete and follow with RETURN. As a matter of fact, this approach is safer since it deletes only one line at a time.

READING THE JOYSTICKS

PDL(n)

The joysticks or paddles can be read via the PDL command. PDL is a versatile command which can return several sets of values depending on the application.

The first controller is assigned odd PDL numbers.

The second controller is assigned even PDL numbers. For this purpose, 0 is treated as an even number which complicates things since the equivalent SECOND controller value is one less than the FIRST controller value.

We will concentrate on the PDL functions of CONTROLLER 1.

PDL	USE	VALUES
1	vertical counter	0-255
3	horizontal counter	0-255
5	direction	see diagram
7	left fire button	0 or 1
9	right fire button	0 or 1
11	keypad value	ASCII 0-9 and '#' '*'
13	keypad value	0 to 15
15	roller controller	?

PDL(1)

PDL(1) updates a counter for the vertical position.

If the joystick is pushed up, this value decreases to a limit of 0.

If the joystick is pushed down, the value increases towards 255.

If the joystick is still or pushed left or right, nothing changes.

In a game environment, you must issue a PDL(1) command every time you want this position to be checked.

If you want to reset the game and centre the PDL, you can poke a 127 into memory location 27100, (27102 for the second joystick).

PDL(3)

PDL(3) updates a horizontal counter in a manner similar to PDL(1).

LEFT decreases and RIGHT increases

The memory address is 27101, (27103).

A combination of PDL(1) and PDL(3) can update the x,y coordinates of the PLAYER.

Every time you issue a PDL command, all pointers are updated. This may produce undesireable results when you call the function twice to get an x,y coordinate. Furthermore, the 0-255 range for the vertical position is unsuitable since it ranges higher than the vertical height of the screen in HGR mode. For these reasons, PDL(5) is recommended for game applications.

PDL(5)

PDL(5) gives a CARDINAL reading based on the 9 positions of the joystick.

The rest position returns a 0 and the others as follows:

```
                NORTH
                  1
      NORTH WEST - 9 | 3 - NORTH EAST
                   \|/
          WEST - 8<- 0 ->2 - EAST
                   /|\
      SOUTH WEST - 12 | 6 - SOUTH EAST
                  4
                SOUTH
```

From the diagram, you can see that NORTH EAST SOUTH WEST are assigned the values 1 2 4 8 and that the intermediate points are the sum of the corresponding values.
Let's consider a GAME application where we want to update the x,y coordinates of the player based upon the joystick position.

```
100 p=PDL(5)
110 y=y+((p=4 or p=6 or p=12)
120 y=y-(p=1 or p=3 or p=9)
130 x=x+(p=2 or p=3 or p=6)
140 x=x-(p>7)
```

In line 110 the logical in brackets checks if the PDL is SOUTH SOUTH-EAST or SOUTH-WEST. If either of these conditions is true, the expression returns a 1 which is added to the value of y; if false, a 0 is returned.

Note that WEST is easier to decode since all acceptable values are greater than 7.

The next step is to make sure our PLAYER does not fly off the screen by making sure the x,y coordinates do not exceed the playing surface. For our sample program, we will set a box from 50,50 to 200,100.

We could use something like IF X>200 THEN X=200 but in a game application, SPEED is often important and we want to take the least amount of computer time possible to evaluate the position. We will therefore use another logical and append it to the lines shown above:

```
110 y=y+(p=4 or p=6 or p=12)*(y<100)
120 y=y-(p=1 or p=3 or p=9)*(y>50)
130 x=x+(p=2 or p=3 or p=6)*(x<200)
140 x=x-(p>7)*(x>50)
```

In line 110, "y<100" will return a 1 if true and a 0 if false. Thus even if the first logical returns a 1, the value of y will not increase if it is already at 100.

PDL(7), PDL(9)

PDL(7) reads the left fire button and returns a 1 or 0.

PDL(9) reads the right fire button.

PDL(11)

PDL(11) reads the joystick keypad and returns the ASCII value of the key pressed. The # and * keys will return those corresponding values. In order to get that value into a string expression, you can use the following:

```
a$=CHR$(PDL(11))
```

PDL(13)

PDL(13) also reads the keypad but returns numerical values equivalent to the key pressed. If you want to select OPTION 1 or 2 via the keypad you can use something like:

```
100 p=PDL(13)
110 IF p=1 GOTO 1000:REM option 1
120 IF p=2 GOTO 2000:REM option 2
130 GOTO 100:REM wait until valid response
```

Note also that the # symbol returns the value 11, the * returns a 10.

It is also possible to simulate the BLUE and PURPLE super controller values which behave as follows:

CONTROLLER	PRESS	VALUES
purple	* and 3	12
blue	# and 3	13
both	# and *	14

In order for these values to be read correctly, you must also change the translation table in the ROS with POKE 57461,14; be sure and reset the POKE limit before doing this.

PDL(15)

PDL(15) is used to read the ROLLER CONTROLLER. As far as I know, SMARTBASIC does not make use of this function. Special decode routines are required to make full use of the return values. Can someone out there enlighten us? Write me or ASG editors.

The PDL command is very versatile but it is essential to use it correctly. The joysticks are not dynamically updated. You must issue a PDL command in order to update the memory values. Each time a PDL command is given, ALL the values are updated in the ROS. The locations illustrated below are updated by BASIC only when a particular command is used:

PDL	MEMORY ADDRESS	PDL	MEMORY ADDRESS
0	27100	7	16784
1	27102	8	16780
2	27101	9	16785
3	27103	10	not maintained
4	16788	11	not maintained
5	16783	12	16781
6	16799	13	16786

LOW RESOLUTION GRAPHICS

GR

The GR command places you in low resolution graphics mode. This mode is similar to the graphics mode in APPLE BASIC and you can copy some of those programs directly with only minor changes.

In the GR mode, the screen is partitioned into a 40 by 40

grid. Each grid can be any colour which gives you reasonable block graphics capabilities.

COLOR

The COLOR command allows you to set the colour for the plot command. The default colour is 0 and is always selected when you enter GR mode.

Colour values may be set from 0 to 15, which should allow for 16 colours but it doesn't. In their efforts to make SMARTBASIC APPLE compatible, COLECO decided to add a translation table which converts the COLECO colours to APPLE colours. I have forgotten which colours cannot be accessed, but it is not important. You can defeat the colour translation with the following POKES:

```
POKE 18735,121:POKE 18736,0:POKE 18737,0:REM COLOR
POKE 19256,0  :POKE 19257,0:POKE 19258,0:REM SCRN
```

Now you can use the standard colours where 0 is transparent, 1 is black, and so on.

PLOT

The PLOT command will paint a block of the chosen COLOR at the x,y coordinates supplied. Say you want to show a single die with the number four. We need to plot four dots in a square pattern:

```
100 GR
110 COLOR=7:REM choose a colour
120 PLOT 10,10
130 PLOT 10,12
140 PLOT 12,10
150 PLOT 12,12
```

HLIN, VLIN

Now we have the four dots, but what about drawing a box around them. I will almost certainly mess it up if I try to plot a whole bunch of points. That's where HLIN and VLIN come in handy. Both commands have a similar syntax and draw horizontal or vertical lines:

```
HLIN from, to  AT line
```

Note that 'from' 'to' and 'line' can be integer values or variables. Back to the die program. Let's change the colour of the die outline and continue with:

```
160 COLOR=13:REM change colour for the border
170 HLIN 8,14 AT 8:REM a line 2 wider and 2 above
180 HLIN 8,14 AT 14:REM same thing below the die
190 VLIN 8,14 AT 8:REM left side
200 VLIN 8,14 AT 14:REM right side
```

SCRN(x,y)

The SCRN command reads the colour of the selected grid position. This can be handy in a game situation where you want to know where OBSTACLES, WALLS, TREASURES, BAD GUYS, etc. are. Why bother keeping a separate matrix with all the positions of the players? Use the SCRN function:

```
a=SCRN(5,5)
```

This command assigns the COLOR value of grid position 5,5 to the variable a. This variable can now be checked against the known colours of walls, obstacles, other players, etc.

SAVING GR SCREENS

I have seen a few programs that save the contents of a GR screen. This seems like such a waste since it can be simply accomplished with the following:

```
 10 DIM m(39,39)
......
799 REM save game and exit
800 FOR x=0 TO 39
810 FOR y=0 TO 39
820 m(x,y)=SCRN(x,y)
830 NEXT y
840 NEXT x
850 REM save the x,y matrix to file or printer
899 REM reload the game
900 REM read the data from file
950 FOR x=0 TO 39
960 FOR y=0 to 39
970 COLOR=m(x,y)
980 PLOT x,y
990 NEXT y,x:REM remember this one?
```

GR BLOCKS

GR blocks are not square. In order to plot a square block, you need 2 wide (2*6=12) by 3 high (3*4=12). Using this technique, you can still create a 13x13 matrix of square blocks which is reasonable for many GAME type applications.

CHANGING THE GR TEXT WINDOW

The GR command sets up a 4-line window at the bottom of the screen. Following are the POKE values required to change the window size:

number of lines	18536(4868)	18539(486B)
4	3	20
5	4	19
6	5	18
7	6	17
8	7	16

CHANGING GR SCREEN COLOURS

The default screen colour on initialization, (Basic just loaded), is set according to the value at address 18633(48C9) which corresponds to 16*colorvalue. The character colour is set according to the byte at 18711(4917) which corresponds to 16*set colour+clear colour, similar to text colour.

HIGH RESOLUTION GRAPHICS

High Resolution Graphics can be invoked in 2 fashions. The HGR command leaves a few lines for text at the bottom and provides a DRAW window of 256 by 160. The HGR2 command leaves no text window so the full 256 by 192 pixel screen is available for drawing.

HCOLOR

HCOLOR, similar to COLOR sets the default pen colour for drawing. As with the GR mode, the colour value is checked for values between 0 and 15, translated and placed in the table. In HGR, it is highly recommended that you disable the check and translation; (see HPLOT for applications).

The value check is disabled with a
POKE of 255 at 11127(2B76)

The translation check is disabled by
POKE of 0 at 18747(4938)

HPLOT

The HPLOT commaod is similar to the PLOT command in GR; it turns on one pixel based on the selected colour.

Although you can draw shapes in any colour you want, the colour bleeding problem rears it's ugly head here again. One problem which can partially be solved is the bleeding problem when neighbouring pixels are turned off and on.

Try these DEMO programs after fixing the HCOLOR check and translation illustrated above:

```
 20 HGR: PRINT"draw a box"
 40 HCOLOR=5
 50 FOR y=100 TO 150:FOR x=100 TO 150
 60 HPLOT x,y:NEXT:NEXT
 70 PRINT"Now erase the centre"
 80 HCOLOR=0
 90 FOR y=110 TO 140:FOR x=110 TO 140
100 HPLOT x,y:NEXT:NEXT
110 print "draw a diagonal in the centre"
120 HCOLOR=10
130 FOR x=110 to 140
140 HPLOT x,x:NEXT
```

This program proceeds OK to draw a box and erase the centre.

When it comes to drawing the diagonal, the other neighbouring pixels are still LIVE and get turned on when the diagonal is drawn.

We can borrow the technique used by the XDRAW command to partially cure this problem. An HCOLOR value over 128 (high bit set) will instruct PLOT commands to turn off pixels rather than paint them a different colour. Try this demo:

```
 20 HGR:PRINT"draw a box"
 40 HCOLOR=5
 50 FOR y=100 TO 150:FOR x=100 TO 150
 60 HPLOT x,y:NEXT:NEXT
 70 PRINT"Now erase the centre"
 80 POKE 16777,128:REM use ERASE color
 90 FOR y=110 TO 140:FOR x=110 TO 140
100 HPLOT x,y:NEXT:NEXT
110 print "draw a diagonal in the centre"
120 HCOLOR=10
130 FOR x=110 to 140
140 HPLOT x,x:NEXT
```

Now we notice a difference when the centre of the blue box is erased: the left and right borders are the same size. Also, when the yellow diagonal is drawn, we get a line instead of a bunch of blocks.

Note that there is still some colour bleeding on the ends of the diagonal but, that can also be partially cured by choosing even multiples of 8 for the start and end points. In the program above, replace ALL the 110's and 140's with 120 and 136 to see the difference.

HPLOT

There is no HLIN and VLIN command in the HGR mode, but HPLOT is a versatile utility which can draw complicated shapes in one command in much the same fashion as a hand-drawing is made without lifting the pen.

The syntax is: HPLOT x1,y1 TO x2,y2 TO x3,y3 ...etc. There is no limit to the number of successive points which can be drawn.

Drawing squares seems to be a problem: they are not square! Try this demo program which sets up a subroutine to draw a square of the specified size:

```
 10 REM square subroutine
 20 x=50:y=50: REM upper left corner
 30 z=100:REM size of square
 40 HCOLOR=15
 50 GOSUB 1000:REM draw a square
```

```
60 end
999 REM square drawing routine
1000 HPLOT x,y TO x+z,y TO x+z,y+z TO x,y+z TO x,y
1010 RETURN
```

The square is deformed because of the mechanics of plotting in which the pen advances one pixel in the chosen direction but does not turn on the dot until it moves to the next pixel.

The trick is then, to adjust the corners by +-1 to square things off. That's why we use a subroutine so we only have to do it right once:

```
10 REM square subroutine
20 x=50:y=50: REM upper left corner
30 z=100:REM size of square
40 HCOLOR=15
50 GOSUB 1000:REM draw a square
60 end
999 REM real square drawing routine
1000 HPLOT x,y TO x+z+1,y
1010 HPLOT TO x+z,y+z+1
1020 HPLOT TO x-1,y+z
1030 HPLOT TO x,y
1010 RETURN
```

Now this one draws a REAL square.

Note also the different syntax used in the subroutine. HPLOT commands can be given with only a TO address. In this case, the HPLOT starts from the LAST PLOTTED POINT or the current position.

For program clarity, the second example is better but for execution speed, it is better to chain them all into one command.

SHAPE TABLES

Although the HGR mode is suitable to complex graphics, it can be quite tedious to map out the entire screen one pixel at a time. That's why we have shape tables.

The format of shape tables is complex and will not be discussed here. Suffice it to say for now that a shape table can be installed anywhere in free memory and its address POKED into memory addresses 16766 and 16767.

SCALE

The SCALE command defines the magnitude of the shape.

A scale of 1 will advance one pixel for each plot command in the shape table.

The scale can range up to 255 for incredibly large shapes which wrap around the entire screen.

When the HGR mode is initialized, the scale is set to 255. It is important then to set the scale to the size you want to use. If you don't, your first draw command will write all over the screen and may take several seconds to complete before you can abort it with CONTROL-C.

DRAW

The DRAW command prints out a shape definition from the shape table according to the shape number specified, using the current HCOLOR at the screen coordinates provided:

```
DRAW 1 at 100,100
```

The draw command can also be given without coordinates in which case it will draw starting at the last pen position.

XDRAW

The XDRAW command works just like DRAW to erase a shape. Simple animation can be achieved by XDRAW and DRAW commands. Just remember to XDRAW your shape before you change the current x,y coordinates for the subsequent DRAW.

ROT

The ROT command is used to specify the rotation of the shapel ROT values range from 0 to 63 representing different angles in a quadrant. All 64 rotations can only be interpreted if the SCALE value is greater than 15 since the nuances in angular displacement cannot be determined at lower values:

The syntax is according to the example:

```
10 ROT =32
```

which rotates the pattern 180 degrees. Thus a ROT of 1 is a little less than 6 degrees.

CHARACTER COLOUR

The character colour in the HGR window is at 25568(63E0) in the format 16*set color+clear colour. The window parameters are as follows:

LINES	25573(63E5)	25576(63E8)
4	3	20
5	4	19
6	5	18
7	6	17
8	7	16

DEFAULT SCREEN PARAMETER ADDRESSES FOR HGR AND HGR2

For both HGR and HGR2 the following are the addresses for the default screen parameters.

ADDRESS	VALUE	DESCRIPTION
25431(6357)	colorbyte	border colour
25471(637F)	17*colorbyte	default screen colour
25479(6387)	colorbyte	default HCOLOR value
16777(4189)	colorbyte	current HCOLOR value

PROGRAM CONTROL COMMANDS

The following elementary commands are very useful if not essential to programs. We will concentrate on making effective use of the elementary CONTROL commands.

RUN is the way to start a program from the first line number if the program is already loaded into Basic RAM. There are 2 other ways, however, to use the RUN command:

```
RUN line_number
RUN file_name
```

The first also requires that the program already be loaded into Basic RAM, and will begin program execution at the specified line number. It will still clear variables and arrays, but will not execute DIM statements which have been skipped by the line number specification. Thus, a program may possibly not be initialized properly if RUN line_number is used.

RUN file_name is the same as the combined statements LOAD file_name and RUN. It also has a disadvantage in that the program pointers and variables are not saved for program re-entry after a crash. e.g.

```
10 x=1
20 y=2
30 INPUT z
```

Save this program under 'test' file name; type NEW; then type 'RUN test'. At the prompt, press CONTROL-C and follow with the typing in of 'PRINT x', 'RETURN'. You will see that the value of x is 0.

Now type RUN and repeat the same procedure. This time, the value of x will be preserved on the interruption.

END marks the end of a program. While it may not be required in most programs, it is a good habit to get into. When your programs grow and you decide to add other features and routines, you may wind up adding lines beyond the actual numerical line number end of the program. You want to avoid nasty messages, errors, crashes, or whatsoever other thing that may make your program mis-behave.

NEW

NEW clears all variables and the program under operation.

It is essential to use this command before typing in a new program to be sure that line numbers from your previous program do not become intermixed with the new one.

It is not necessary to use NEW before LOAD or RUN since both these routines call the NEW routine.

IF you have a protected program that you don't want people to fool around with, put a NEW command instead of END where your program terminates. That will help prevent others from analyzing your program and finding clues to the game or problem.

DO NOT use the NEW command in test versions of your program since you will find it difficult to debug and improve your program if it disappears every time it exits.

STOP

STOP is a handy way to temporarily suspend your program under test.

Suppose you want to check certain values before entering a particular subroutine which is causing you problems:

```
99  REM plot subroutine
100 PRINT x,y: STOP: REM check these values
110 PLOT x,y
120 RETURN
```

Every time you GOSUB 100, the x,y coordinates will be printed out along with BREAK IN 100. If the values are out of range, you can check other values that you might have had the program calculate, by typing 'PRINT a(2,3)' for example, or any other similar command, including LIST.

If everything checks out ok, you can just CONTINUE the program with a CONT command. You can make a STOP conditional with something like:

```
100 IF x>39 OR y>39 THEN STOP
```

STOP can also be used to find out if a program reaches a particular point. Consider the following example:

```
100  IF x<0 GOTO 1000
110  IF x>100 GOTO 1000
```

If you reach the routine at 1000, you may not know why you got there. In order to check this situation, change the second line to:

```
110  IF x>100 THEN STOP: GOTO 1000
```

Now when x>100, you get a break and when you enter CONT, the program resumes.

TRACE

TRACE can provide a more detailed check of program execution by reporting all the line numbers being executed.

Unfortunately it does not set up a VIEW window and winds up writing line numbers all over the screen: (that in itself could be a major project for a BASIC re-write).

Furthermore, if your program uses cursor control commands like HOME, VTAB, and HTAB, your line number trace will be hard to follow, however setting SPEED to 100 or less, may will allow you to follow the line numbers before they are wiped out.

This makes the monitoring of a long program tedious, so some place the SPEED and TRACE commaods at discreetly chosen places within the program to avoid the tedium. The command can be useful if used wisely.

NOTRACE

NOTRACE turns the TRACE off. These 2 commands can be used together within a program to isolate the routine under review:

```
100  INPUT x,y
110  GOSUB 1000
...
999  PLOT subroutine
1000 TRACE
1010 IF x>39 GOTO 1050
1020 IF x<0  GOTO 1060
1030 IF y<0  GOTO 1070
1040 IF y>39 GOTO 1080
....
1100 PLOT x,y
1110 NOTRACE
1020 RETURN
```

In this example, the trace will only be active while the subroutine at 1000 is being executed. This presumes that all branches of the subroutine eventually wind up at line 1110 to turn TRACE off.

ERROR TRAPPING

If you want a professional looking program which does not crash upon improper input or behaviour, you can use error trapping. Complicated error traps can make it virtually impossible to break into your programs.

WARNING! This is an advanced subject and can lead you into serious difficulties and the loss of valuable programs if used incorrectly.

Save all your error trapping until a program is completely debugged. Even so, work on a duplicate copy of your program just in case something goes wrong.

ONERR

ONERR activates the error trapping sequences. It will send the program to an error handling routine via a GOTO statement.

It is the programmer's responsibility to write an appropriate error routine.

ONERR will trap ALL errors (including ^C), except the "Extra Ignored" which is not an error but a warning.

```
10      ONERR GOTO 60
20      INPUT x,y
30      PRINT x/y
40      IF x=0 THEN END : REM allow exit
50      GOTO 20
60      PRINT "division by zero error"
70      GOTO 20
```

Try running this program with normal values; now enter 1,0 and your error handling routine takes over, prints the message, and prompts for input again.

Try entering strings 0,0 to exit and find that the error handler takes over since it tries to do the division before checking for the EXIT cue. Type 0,1 to end.

Now, delete line 40 and run the program again....your first unbreakable program!

RESUME

RESUME can be used in an error handling routine to return to the line number that caused the error.

Note that it will try to re-execute the statement that caused the error rather than skip to the next statement. To prove this point, re-write the program above and substitute:

```
70 RESUME.
```

Now when you generate an error with input like 1,0 the program locks itself in a loop and keeps reprinting the divide by 0 error and then insisting on re-executing line 30.

Ah well, CONGRATULATIONS, another program that gets out of control and can't be broken! But is it really? Try typing ^C several times. If you are fast enough, you might be able to catch the operating system off guard and break with a strange message like Break in 17042. But there is no such line number.

At this point, you should reboot BASIC, because any other action may result in a FATAL SYSTEM ERROR. Stranger things have been known to happen!

CLRERR

CLRERR is used to turn off the error trapping and is an essential companion to ONERR.

IF the routine illustrated above is part of a bigger program, you don't want ALL errors to branch to a DIVIDE BY 0 message.

Consider the following:

```
10      ONERR GOTO 60
20      INPUT x,y
30      PRINT x/y
50      GOTO 80
60      PRINT "division by zero error"
70      GOTO 20
80      CLRERR
90      INPUT x,y
100     PRINT x/y
110     END
```

Run this program and enter 0,0 the first time; the error handler takes over. Now enter a valid value, like 4,2 and get 2 for an answer. As we are now, at line 90, try entering 0,0 and get the usual BASIC message, (since the error trapping has been turned off at Line 80).

ERRNUM

ERRNUM(0) can also be used in error trapping.

ERRNUM(0) CODES AND WHAT THEY MEAN

```
 2 range error; parameter too large to handle by parser
 5 end of data in a file read, (see 42)
 7 file not found
 8 bad read or write to disk/DDP (ambiguous error)
 9 directory or disk/DDP full
10 file is locked in write or delete operation
11 bad file name or other syntax in ^D operations
12 too many characters after ^D, or too many files open
13 file type mismatch, trying to read a binary file
16 illegal function in a READ or INPUT statement
22 RETURN encountered with no GOSUB pending
42 out of data in a READ statement (see 5)
53 illegal quantity (string, PEEK, POKE, SPC, TAB, etc.)
69 floating point or integer number too big
77 out of memory (too many Loops, program too big, etc.)
90 undefined statement for GOTO or GOSUB
107 bad subscript; values outside the limits of DIM
120 same array specified twice in DIM statement
133 division by zero
163 type mismatch
176 string longer than 255 characters
191 formula too complex
224 using FN (function) with no DEF FN
254 bad response to INPUT
255 a STOP statement was reached or ^C was pressed
```

Now let's go back to our first program to make the error handler smarter using ERRNUM(0).

```
 10 ONERR GOTO 60
 20 INPUT x,y
 30 PRINT x/y
 50 GOTO 20
 60 err=ERRNUM(0)
 70 IF err=133 then print "divide by zero":GOTO 20
 80 IF err=255 theo print "Program Aborted":END
 90 Print "Unknown error #";err
100 END
```

Now we have an error handler that can make decisions. If the error is divide by zero, tell the user and try again. If ^C was pressed, end the program. If any other error occurs, show the error code and end the program.

Although there are several ways of handling errors, my recommended approach is to make one routine for each critical part of your programs. That way you always know where you are.

Although DATA FILE ACCESS will be discussed at a later place, consider this sample program which handles errors in stages

```
10      INPUT "File Name ";f$
20      ONERR GOTO 50
30      PRINT CHR$(4);"Open ";f$
40      CLRERR:GOTO 100
49      REM handle bad file name & I/O error
50      ...
100     ONERR GOTO 150
110     FOR x=1 to 10
120     INPUT x :REM from file
130     NEXT x
140     CLRERR:GOTO 200
149     REM handle end of data, syntax, EOF etc
150     ...
```

Each section of the program has its own error trap and can handle the errors more efficiently via ERRNUM(0). Note the CLRERR statement at the end of each critical routine.

NOBREAK

NOBREAK has been the subject of at least a few discussions and it seems very few people understand it. Here's by best interpretation.

SMARTBASIC continually scans the keyboard for a ^C and aborts your programs at your request. Using the NOBREAK command defeats this feature, but not entirely. When a program writes to the screen, a ^C will always work. Try the following program:

```
10      PRINT "Press control-C"
20      NOBREAK
30      FOR x= 1 TO 5000:NEXT
40      PRINT "It did not work, did it?"
50      PRINT "Press control-C"
60      GOTO 50
```

During the first loop, ^C is disabled since there is no screen output. When line 50 get executed in a loop, ^C will abort.

So what's the advantage?

Since the keyboard is not scanned, you can increase a program's speed (only marginally) by using NOBREAK in your CPU intensive tasks.

The best advantages come into play when you use HGR2 mode. Since there is never any screen output, NOBREAK will make a program harder to abort.

The best advantage, however, will be TYPE AHEAD!. Consider this program:

```
10      HGR2
20      NOBREAK
30      GET c$
40      HCOLOR=VAL(c$)
50      FOR x=0 to 255
60      HPLOT x,100
70      NEXT
80      do=do+1
90      IF do=10 THEN TEXT:END
100     GOTO 30
```

Run this program and press 1 2 3 4 5 6 7 8 in rapid succession and WAIT. You will see the line changing colours as each colour value is interpreted. After 10 iterations, the program ends. Note that without line 90, the program would lock up...and would be another UNBREAKABLE program.

BREAK

BREAK is the opposite of NOBREAK; it reactivates the ^C checking in your program.

PLAYING WITH RAM

RAM stands for Random Access Memory. All of the 64K available under SMARTBASIC is RAM area. This means that different values may be placed in any memory location, and modified, as required, by the controlling program.

ROM (Read Only Memory) on the other hand, can only be read. One example of ROM is the memory of the GAME cartridge, where the actual game is stored while you carry it home from the store.

The information on these cartridges is constant. The program contained in a ROM is sometimes copied to RAM prior to program execution.

Before looking at commands that affect RAM, let's make a quick memory map of the standard RAM used by SMARTBASIC:

ADDRESS	DESCRIPTION
00000-27407 (0000-6B0F)	SMARTBASIC program
27407-?? (6B0F-??)	Variables stored up from here
??-54272 (??-D400)	User program stored down from here
54272-57344 (D400-E000)	3 1K buffers for directory & files
57344-65535 (E000-FFFF)	Operating System

The RAM space between the question marks (26865 bytes) is the RAM area available for user programs. As you write a new program, the top of available memory is adjusted down from 54272.

When you RUN your programs, the space from 27407 gets filled upward for each variable and string that you define in your program. If the 2 ever meet, you get that nasty OUT OF MEMORY error.

FRE(0)

FRE is used to find out how much memory is available. Since FRE is a variable command (similar to the trig functions), it requires a parameter even though it is not used. Thus FRE(0) is the same as FRE(22). When you first BOOT BASIC, you can ask for the amount of free space with:

```
PRINT FRE(0)
```

You should get

```
25954
```

But 25954 is less than the 26865 described above. That is some variables are already defined (the variable commands) and take up a bit more than 900 bytes of RAM.

The FRE command can be used within programs to check on the available space.

When FRE calculates the memory space, it begins by doing some house cleaning in the string space by crunching up strings which are no longer required. Then it reports the available memory. To force this house cleaning operation, add a line like:

```
f=FRE(0)
```

in a strategic location in your programs. This may help prevent the loss of valuable strings when sorting large string arrays.

PEEK(n)

PEEK is used to report the value in a particular memory location 'n'. It does not desroy the value there, but merely reports it. This can be handy to check on the status of an operation, or to read data.

Let's consider one application. I have a program which performs several LONG iterations (like GAME OF LIFE simulations). I want to give the user a chance to abort without having to press CONTROL-C. Since we know that the last keypress register is at 64885, we can PEEK that address to detect the abort request:

```
1000 GOSUB 2000: REM do one generation
1010 p=PEEK(64885)
1020 if p=ASC("q") THEN END: REM quit request
1030 if p=ASC("r") GOTO 100: REM restart request
1040 GOTO 1000: REM continue if no option
```

Since PEEK returns a positive integer, we must compare (in 1020 and 1030) with an integer value by comparing to the ASCII value of the option letters. Note that we could have compared with 113 and 114 but ASC ("q") makes it clear that we are checking for the letter q. When execution speed is not critical, this is a highly recommended programming technique.

POKE

POKE is the opposite of PEEK; it places a value in a RAM address. POKE 27407,25 for example would place the value 25 in location 27407. This can later be verified with PRINT PEEK(27407) in the immediate mode.

POKEing below 27407 should be done with extreme caution as it will change the SMARTBASIC program.

POKEing above 54372 should also be done with great care since this will change the operating system. SMARTBASIC protects against this by preventing POKEs at higher addresses.

Novices should not change the POKE limit until they are ready to experiment with the BOS.

To maximize the POKE limit: POKE 16145,255: POKE 16146,255.

LOMEM:

LOMEM can be used to reserve RAM area for user routines or data. LOMEM commands should be placed at the beginning of your programs since LOMEM also clears variable arrays before adjusting the memory pointers.

The syntax:

```
LOMEM:28000
```

will set aside 593 bytes from 27407 to 27999 in which you can POKE to your heart's content. You don't have to worry about overwriting your program, variables, or SMARTBASIC itself.

Note that the LOAD, CLEAR, and NEW commands do not affect the LOMEM setting.

Programs that set LOMEM abnormally high may cause you OUT OF MEMORY problems later on when loading other programs. Should this ever happen, type NEW and follow with PRINT FRE(0).

If you don't have enough memory to load in the new program, reset LOMEM:27407 in the immediate mode, and LOAD again. As an added precaution, have programs which reset LOMEM to its normal setting as part of the exit routine.

HIMEM

HIMEM is similar to LOMEM but it protects RAM above the specified address. HIMEM is complicated to use since it requires knowledge of the size of your program.

HIMEM must be located below the end of your program by an offset equal to the number of bytes you wish to reserve.

As HIMEM has no apparent advantages over LOMEM, its use is discouraged.

Contrary to LOMEM, HIMEM is reset every time a program exits.

CALL

CALL is used just like in MACHINE LANGUAGE routines to execute a routine at a particular address. This is an advanced command which should be left to experienced programmers. The CALL routine saves all the program pointers, executes the requested routine, restores the program pointers and clears the accumulator prior to resuming the BASIC program. It is the programmer's responsibility to preserve the stack and/or set up a local stack.

USR(n)

USR is similar to CALL except that it always branches to the USR routine which is stored by you at memory address 16130-16131 (3F02).

At BOOT, this address points to a RETURN and no harm can be done by a USR command.

USR is similar to CALL in that program pointers are preserved and the accumulator cleared on exit. The advantage of the USR function is its ability of passing the parameter 'n' to the user routine. When the USR routine gets control, the DE register points to the function number 'n' with the high bit set.

Since USR is a variable command, it requires a variable. Thus the correct syntax is:

```
a=USR(n)
```

where 'a' is any legal numerical variable and 'n' is the function number, from 0 to 255. Since the high bit is set, values from 128 to 255 are the same as 0 to 127.

Unless the USR routine so desires, no particular value is returned in A. Incidentally, it would be a very complex procedure to assign values to BASIC variables, (like assigning a value to a), from a machine language routine.

For more on USR see the MACHINE LANGUAGE chapter (30), where a working USR routine is presented.

&

The & routine is similar to the USR function; it does, however, preserve the DE register which is the pointer to current position in the command line of the Basic program being executed.

The routine is useful for those applications where the user wishes to parse a series of instructions from the Basic program command line.

It is the programmer's responsibility to return the DE register pointing to next instruction in his Basic program, and to clear error conditions in the accumulator.

& gets its execution address from memory location 16132-16133 (3F04), which execution address must be loaded to 16132-16133 by the programmer.

At BOOT, this two-byte address points to REM which effectively ignores the rest of the line.

You may have seen on occasion a programmer use & as a REM statement. This practice is not recommended for programs which will be distributed since other people may have installed & routines.

In order to use the & routine, it is necessary to know something about the register use of the Z80 microprocessor in SMARTBASIC:

DE=pointer to the current line being executed, actually pointing to the command line in RAM, and is in fact pointing to the "&" or its token.

C' has the number of characters remaining in the line. this can be used by the user to calculate the end of his line during his parse process.

See the MACHINE LANGUAGE chapter (30) for a working & routine.

WAIT

WAIT is another advanced command which is used to wait for a particular value in a port. Its use requires detailed knowledge of port operations and status codes returned by peripherals. The syntax is:

```
WAIT a,b,c
```

where a is the PORT number, b is the XOR value of the value awaited, and c is the AND value of that value. The WAIT command will get the value from the port, XOR it with B, AND it with C and continue this operation until a non-zero result is obtained. Using WAIT without the proper parameters will effectively lock up your system.

STRING FUNCTIONS

As string operations are all VARIABLE COMMANDS, they require a parameter (string) which is included within parenthesis.

Note that when a literal string is included, it must also be in quotes. This will become more clear in the examples that follow.

LEN(x$)

LEN will give you the length of the string. This is sometimes a very useful value which can be used as a loop counter:

```
10 INPUT "Name ";n$
20 FOR x=1 TO LEN(n$)
30 REM perform some manipulation
40 NEXT x
```

ASC(x$)

ASC will convert a string to an ASCII value. Expanding on the sample program above, we can do the following:

```
10 INPUT "Name ";n$
20 FOR x=1 TO LEN(n$)
30 PRINT ASC(MID$(n$,x,1))
40 NEXT x
```

This program will print the ASCII values of the supplied name.

Note that we have nested one string operation as a parameter for the other. This is quite acceptable as long as the correct number of brackets are opened and closed.

Note also that ASC works on the first character of any string. Thus to check string input for 'y', you can use the following which will be true if y, yes, yuppi, yukky, or anything else starting with y was typed:

```
100 INPUT q$
110 IF ASC(q$)=ASC("Y") or ASC(q$)=ASC("y") GOTO 200
110 REM process NO answer
200 REM process YES answer
```

CHR$(x)

CHR$ converts a number to its equivalent string character, the reverse of converting a string character to the ASCII.

Going back to our sample program at the start; let's use ASC and CHR$ to convert input to upper case:

```
10 INPUT "Name ";n$: o$="": REM set to empty
20 FOR x=1 TO LEN(n$)
30 a=ASC(MID$(n$,x,1)): get one character value
40 if a>96 and a<123 then a=a-32: make UPPER if a-z
50 o$=o$+CHR$(a): REM add new character to o$
60 NEXT x
70 PRINT o$
```

Note here the addition of strings. When 2 strings are added together, the second is appended to the end of the first. You can see this in the following example:

```
10 a$="add"
20 b$="ition"
30 PRINT a$;b$: REM show what they look like
40 c$=a$+b$
50 PRINT c$: REM same result
```

VAL(x$)

VAL is similar to ASC except that it converts an entire number (not just a digit) to a numerical value:

```
10 INPUT"Give me a number "n$
20 n=VAL(n$)
30 PRINT n
40 GOTO 10
```

You can type in positive or negative numbers, even numbers with exponents; the VAL function handles them. Now try typing "32 dollars" and "$32" as a reply. The first come out all right but the second yields a result of zero.

This is because the VAL function aborts whenever it encounters a non-number character. Note that 'number' characters include the +,-, and E characters, provided they are in their expected position.

STR$(x)

STR$ converts numerical values to strings, the reverse of VAL. Let's look at one application of this function to RIGHT JUSTIFY a column of numbers.

Type in the following program and give it 10 values to display. Remember to include some MINUS figues and some with 1, 2, and 3 decimal places:

```
  10 PRINT "GIVE ME 10 DOLLARS AND CENTS FIGURES"
  20 FOR I= 0 TO 9: INPUT D(I): NEXT
  30 FOR I= 0 TO 9
  40 D= D(I): GOSUB 1000: NEXT I: END
 999 REM ROUTINE TO PRINT D (RIGHT JUSTIFIED)
1000 D$= "$": IF D<0 THEN D$= "-$": REM SET PREFIX
1010 D= ABS(D): REM STRIP MINUS SIGN IF ANY.
1020 T$= D$ + STR$(INT(D)): REM GET WHOLE DOLLAR
1030 PRINT SPC(20-LEN(T$));T$;: REM PRINT DOLLARS.
1040 C=D- INT(D)+ .0051: REM GET THE PENNIES.
1050 IF C<.01 THEN PRINT ".00": RETURN:REM ABORT.
1060 PRINT LEFT$(STR$(C)+"00",3): REM ADD DECMAL.
1070 RETURN
```

The first 2 lines of the subroutine decide whether to start with $ or -$, based upon the sign of the 'd' variable.

'd' is then converted to a positive number.

In order to right justify around the decimal point, the WHOLE DOLLAR portion of 'd' is extracted via the INT function and

converted to a string via the STR$ function.

When this is added to the d$ which was defined in line 1000, we have the total number of characters to be printed left of the decimal.

Line 1030 accomplishes the right justification by printing spaces equal to the difference between 20 (our pivot point) and the length of the string. The dollar value is printed. Line 1040 figures out what pennies remain and line 1050 uses LEFT$ (covered below) to print exactly 3 figures which may or may not be zero.

LEFT$(x$)

LEFT$ extracts a portion of a string from the beginning of the string to a specified length.

The syntax is LEFT$(string,length) where string can be any valid string expression, (even string addition is allowed), and length is an integer from 1 to the length of the string.

Note that any string parameter which exceeds the length of the string does not generate an error, it simply returns the maximum possible value based on string length.

RIGHT$(x$)

RIGHT$ extracts a portion of a string from it's right side (or end). It uses the same syntax as LEFT$. Consider the following example of LEFT$ and RIGHT$.

```
10 INPUT w$
20 y=LEN(w$)
30 for x= 1 to y-1
40 PRINT LEFT$(w$,x);" + ";RIGHT$(w$,y-x)
50 NEXT x
```

MID$(x$)

MID$ is much more versatile in that it allows the selection of any part of a string whether beginning, middle, or end.

The syntax is MID$(string,start,length) where string is any valid string expression, start is the integer position at which to start and length is the number of characters to extract.

If the length is not provided, MID$ will extract from current position to the end-of-string. This is an undocumented and very powerful feature of string operators.

Consider the example above. In order to print the second half, it was necessary to subtract the start position from the total length of the string. Using MID$, this operation is not necessary, nor is it necessary to even know the length of the string. Consider the following:

```
10 INPUT w$
30 for x= 1 to 10
40 PRINT LEFT$(w$,x);" + ";MID$(w$,x+1)
50 NEXT x
```

If the string is 10 or shorter, this routine will behave in an identical fashion to the routine using RIGHT$. Note, however, the more simple arithmetic for the second half: start at x+1 for the rest of the string.

When dealing from a 'deck', programmers usually turn a 'card' ON or OFF when dealing. When a random card is selected, it's availability is checked prior to selection. While this works reasonably well with small arrays, larger arrays (eveo 52) often cause problems when dealing those last few cards: we just can't seem to randomly hit them.

The following example uses string manipulation to solve the problem. Our first assumption is that the cards are numbered from 1 to 52. The cards from 1 to 13 are clubs (for example), 14 to 26 are diamonds, etc.

```
 99 REM initialize the deck
100 d$=""
110 FOR x=1 to 52
120 d$=d$+chr$(x): REM put each card in line
130 NEXT x
140 RETURN
199 REM pick out one card from the deck
200 l=len(d$): REM get the remaining length
210 r=int(rnd(1)*l+1): REM get a random position
220 c=asc(mid$,d$,r,1): REM get the card value
230 a$="":if r<>1 then a$=left$(d$,x-1)
240 b$="":if r<>1 then b$=mid$(d$,x+1)
240 d$=a$+b$: REM crunch the deck
250 RETURN
```

We have 2 subroutines. The first at 100 initializes the deck. Although this is not shuffling, picking out cards at random within the deck will have the same effect.

The second routine at 200 figures out the number of cards remaining in the deck and picks out a random number in that range. Variable "c" contains the value of the selected card from 1 to 52.

Lines 230 and 240 cut the deck in 2 sections, the first before the chosen card and the rest after it.

Note the protection which MUST be included in the event that the chosen card was the first or the last card.

Finally, the 2 halves are added together to form the REMAINING deck. Using this technique, you always get a hit instead of trying to pick cards which have already been used.

MATHEMATICS FUNCTIONS

Although most variable commands are mathematical functions, a few are not; notably FRE and USR. Variable commands are those commands which pass a parameter within brackets: eg INT(123.45).

The parameter is evaluated by the function in order to determine the result.

Presumably to save on interpretation and parsing code, the designers of SMARTBASIC adopted a complicated technique which dynamically relocates these variable commands based on the LOMEM setting. Each of the variables is defined as an array and the array simply points back to the execution routine for each function.

When you are playing around with memory and accidently write where you should not, the variable commands are invariably the first ones to suffer. When they start mishehaving, the best thing to do is reboot.

I will not attempt to describe the calculation method for algebraic and mathematical functions, for even if I understood it completely, it would take several pages to explain. The purpose of this segment is to remind you that these functions are there and clarify their use as required.

INT(x)
INT extracts the integer value of a real variable. Since it truncates rather than round off, statistical calculations will be more precise if you use

```
INT(x+.5).
```

You will also find that certain numbers truncate in a strange fashion. I have never noted the exact numbers, but the floating point has difficulty handling numbers like .001. For this reason, I often use

```
INT(x+.50001).
```

This helps to avoid those nasty INTEGER values which wind up being 37.9999997.

ABS(x)
ABS takes the absolute value of a number by removing its sign thus ABS(-12) will yield 12. You can use ABS to make a number negative with something like -1*ABS(x).

SGN(x)
SGN will report on the sign of a variable. SGN will return 0 if the variable is 0, -1 for negative values, and +1 for positive values. SGN can be used in conjunction with ON GOTO in the following fashion:

```
999  REM make decision on sign of x
1000 sx=SGN(x)+2: REM make result 1,2,3
1010 ON sx GOTO 2000,3000,4000
2000 REM handle negative
3000 REM handle zero
4000 REM handle positive
```

LOG(x)
LOG takes the natural LOG, (base e), of a number. If you are curious, the value of e is 2.718281828.... You can come close to this value by asking SmartBASIC for the LOG(10). If you want to take base 10 LOGS, just divide the LOG value by LOG(10).

EXP(x)
EXP is the complementary function which raises e to the power of the argument "x". Thus EXP(2) is the same as e^2. This function is redundant for powers of 10 since you can use 10^2 or 1.0E+2 and get the same result for example. It would be tedious, however to write 2.718281828^2.

SQR(x)
SQR extracts the square root. Thus the Pythagorean theorem would be calculated by hyp = SQR(s1^2 + s2^2). The square root can also be expressed with hyp = (s1^2 + s2^2) ^ (1/2), but SQR is more convenient.

TRIG FUNCTIONS

Before discussing the TRIG functions, I need to review a bit about RADIANS.

Computers insist on working with radians rather than degrees. If you remember your high school trigonometry, there are 'pi' radians in 180 degrees or about 57.3 degrees per radian. 'pi' (despite what textbooks might say) has the value 3.141592657... and you can define RAD=180/3.141592657 to use as a conversion from degrees to radians. This will become more clear in a moment.

SIN(x)
SIN takes the sine of the specified radian. If you would rather work in degrees, use something like SIN(45/RAD) to evaluate the sine of 45 degrees.

COS(x)
COS takes the cosine of the specified radian. Again, if you remember you high school math, COS(x)=SIN(90-x). Thus COS(45) should be the same as SIN(45).

Define RAD as outlined above and print SIN(45/RAD) and COS(45/RAD). If you change the value of 'pi' in the equation to a different value like 3.141592655, you will see that the values are not the same. Thus the value given above is the CORRECT one for working with ADAM's floating point accumulator.

TAN(x) AND ATN(x)
TAN takes the tangent and ATN takes the arc-tangent; the latter function is difficult to calculate manually.

All other TRIG functions can be evaluated using the 4 functions above; you just have to remember how it's done. I must admit I have forgotten.

RANDOM NUMBERS

This expose will explain how and why RANDOM works, and help you get the most out of it.

RND(x)
The RND function returns a random number between 0 and 1. Although the value is never 1, it is possible for it to equal exactly 0. There are 3 ways to ask for a random number:

RND(1) or RND(2), or any positive number, will extract the NEXT random number from the generator. The argument value is unimportant.

RND(0) will restore the previously generated random number. This might be useful if your program FORGETS what the last random number was and you want to double check its value without affecting anything else.

RND(-x) will reset the random seed to a particular value based on the supplied number. This can be useful in GAME debug situations where you may want to recreate an exact condition.

Now what to do with random numbers? What use is a number between 0 and 1. Well quite simply, you multiply it by the number of choices you have to make.

If you want to randomly decide whether to go North South East or West, use something like: move=INT(RND(1)*4+1).

Note that we multiply by 4 (the number of choices) and add 1 before taking the INT. This will give us a random INTEGER which is 1, 2, 3, or 4. This result can be used with an ON GOTO statement to branch to the correct routine.

While the SmartBASIC floating point accumulator is one of the better ones available for Z-80 machines, it has problems with numbers like 0.001, 0.01, .999999993, and .999999994.

You may have noticed the strange behaviour of the INT function on some of these numbers. Rounding errors may cause these numbers to exceed the desired values. Since there is no FIX for this problem, the programmer is on his own. In the example above, you could use something like:

```
move=INT(RND(1)*4+1): IF move = 5 THEN move = 4
```

On the odd chance that an illegal value of 5 is assigned, it will be corrected to 4 as it should have been in the first place.

NEW and RUN insist on re-initializing the random seed by copying 4 static bytes into the random generator. This is supposed to prevent the random number generator from breaking down but it has the effect of generating the same random numbers every time a program is run.

You may have seen some random routines which try to overcome this problem. While there are many approaches, the following is my favourite in simplicity and safety -- it is a hard one to CHEAT:

```
150 PRINT "Do You Want Instructions (Y/N)?"
160 p=PEEK(64885): REM record current keypress value
165 REM stay here until a different key is pressed
170 if p=PEEK(64885) then r=RND(1):goto 170
180 p=PEEK(64885):REM get current key
190 REM now check for y Y n N
200 REM if none of the above branch back to 170
```

While not fool proof, this method will give the hackers a hard time.

But look at it this way: If I play a game it's no fun if it is the same game all of the time. Those who want to play THE SAME GAME will find a way to do it, so don't bother with them.

But why should BASIC reset the seed and force me to do all this extra work? NO REASON. As a matter of fact, you can POKE zeroes into addresses 11907 to 11918 to disable the re-setting of the random seed. I have experienced no ill effects from this approach.

LOGICALS

Logicals are perhaps the most misunderstood portion of BASIC programming. Yet they can be one of the most powerful programming tools. Not only can logicals make programs shorter, they can make them run much faster.
What is a logical? It is an instruction which uses the result of an operation to make a decision. One of the more common examples is conditional branching:

```
100     IF x>0 GOTO 500
```

When the computer encounters the "x>0" it checks whether this is true or false. If it is true, a LOGICAL TRUE (1) is assigned, otherwise a 0 is assigned. If the result of the logical is true, the rest of the command line is executed.

AND - OR

The AND logical will yield a TRUE result only if BOTH supplied equations are true. The OR logical will be true if either equation is true. Thus to make a jump if either player has a score of 100, you would say:

```
100     IF p1=100 OR p2=100 GOTO 500
```

To jump if player 1 has 100 AND the number of turns is 20, you would say:

```
100     IF p1=100 AND t=20 GOTO 500
```

NOT

The NOT logical REVERSES the value of a variable. If it was non-zero it becomes zero; if it was zero it becomes 1.

```
100     x=100:PRINT x
110     x=NOT x:PRINT x
120     x=NOT x:PRINT x
```

would yield 100,0,1 respectively. How useful is this? Let's take a simple game example where the computer and player take turns playing first.

```
100     x=NOT x:IF x GOTO 500:REM computer move
```

Note also the use of "IF x" which reads "if x not equal to zero". Every second time this statement is executed, x will be non-zero and the jump will be made.

OTHERLOGICALS

Other logicals include = <>(not equal) > < >= => <= =<. Note that the last 2 pairs are equivaleot and mean greater or equal and less than or equal. These logicals are often used in programs but they can usually be made more effective by careful planning:

```
100     IF x=2 GOTO 110
105     y=y-1
106     GOTO 120
110     y=y+1
115     z=z/2
120     more program
        ........
100     IF x=2 then y=y+1:z=z/2:goto 120
110     y=y-1
120     more program
```

Both routines accomplish the same task but the second works much faster sine there is less jumping around. Remember that when a logical is false, the rest of the line is discarded, not just the rest of the statement. IF you look for the condition which requires the least amount of calculations, it can be put on the first line and jump over the next. Therefore in the example above, a better way would be:

```
100     IF X<>2 THEN Y=Y-1:GOTO 120
110     Y=Y+1:Z=Z/2
120     MORE PROGRAM
```

When dealing with integer valuess, avoid the >= and <= logicals whenever possible. For example:

```
if x<= 5 GOTO   takes more time than
if x<6 GOTO
```

If it is possible for x to have a value of 5.1, then the second equation will not have the desired effect. BUT:

```
IF x<5.00001    will work faster.
```

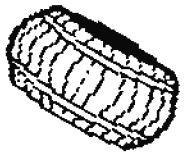
Now for something a bit more complicated. let's say we have a menu selection of "Edit Sort File Print Quit" that we want to evaluate using the single keystrokes "e", "s", "f", "p", "q":

```
100     GET q$
110     if q$= "e" GOTO 500
120     if q$= "s" GOTO 600
130     if q$= "f" GOTO 700
140     if q$= "p" GOTO 800
150     if q$= "q" GOTO 900
160     GOTO 100: REM wrong keypress, try again.
```

This system can become quite tedious. Remember that logical TRUE is 1 and that logical FALSE is 0, and inspect the following:

```
100     GET q$
120     q=1+(q$="e") +2*(q$="s") +3*(q$="f")
        +4*(q$="p") +5*(q$="q")
```

```
130     ON q GOTO 100,500,600,700,800,900
```



It may look a bit messy at first, but it works much better and saves program lines. First, q will always equal at least 1, which will be compatible with ON GOTO. Secondly, only one of the values within parentheses will be true and q will be assigned values 2,3,4,5, or 6; depending on the value of q$.

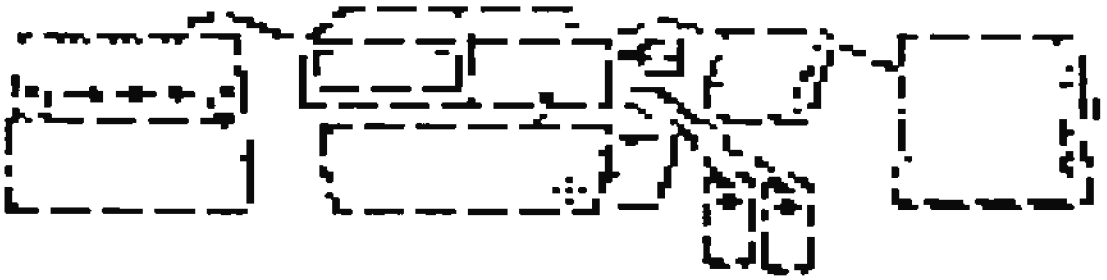
If an incorrect entry is made, q will be 1 and the ON GOTO will send it back to get another keypress. Note that neither of the 2 routines above handles uppercase characters. This could be done in either one by using something like q$="e" OR q$="E".

Refer to the JOYSTICK section of this article for another complex use of logicals.

Although the SMARTBASIC logical set is not the most extensive, (no ELSE, WHILE, WHEN, etc), those available will let you make any decision or calculation. Effective use of logicals can reward you with increased program speed in a reduced size.

Guy Cousineau of AJM SOFTWARE

THIS IS YOUR ADAM ON PIRACY



ANY QUESTIONS

??????????????????????????

Courtesy of:

ADAM News Network

SOFTWARE FOR THE EOS

by Eric Danz

ACOLYTE SOFTWARE

OpenFILER V3.0 with OpenRECIPE (D/DP) $14.95 Will read a SmartFILER or RecipeFILER data base and convert it to a sequential ASCII file by re-writing the records onto a new tape or disk. The new sequential file can then be read by SmartWRITER, SmartBASIC, or brought into CP/M or T-DOS through the CP/M ADAM.COM utility or the T-DOS improvement thereof.

Once in the T-DOS or the CP/M environment, the file can be directly read by dBASE, WordStar, or other wordprocessor or editor application programs. Your new sequential file can even be sent to another computer via the modem.

OpenFILER V3.0 also provides: full recovery of the TEXT field, temporary delete and un-delete of individual records, ability to convert only a specified range of records, replacement of "text field" commas, (for use with BASIC or dBASE); and much more.

Included with the program is a comprehensive documentation file that will guide you through the use of the program, as well as some suggested uses for the resulting file. The program REQUIRES at least two drives, (disk or data drives).

ADAM'S HOUSE SOFTWARE

FILE PRINTER (D/DP) 14.95 Designed to work with a Panasonic KX-P series printers, allows you to print SmartWRITER compatible documents using many of your printer's special codes. You can use different widths, different fonts, two margin settings, and line justification. To use these functions, you insert embedded commands within your document as you type it in the normal SmartWRITER, store the file, and then boot FILE PRINTER. You have three options:

(1) newsletter column printer,
(2) SmartWRITER file printer, and
(3) dot matrix printer function.

Option "1" prints your SmartWRITER document on the left side of the page.

Option "2" will print the SmartWRITER file with your print selections. This turns out a very impressive hardcopy.

Option "3" allows you to set up your printer with the print options of your choice.

INVOICER III (D/DP) $19.95 (Memory Expander Required) Designed for a small business, INVOICER allows up to 500 inventory items stored in memory. All inventory items can be accessed directly from memory. (When data is stored in memory, and can be extracted directly therefrom, time is saved by not having to have the program search a tape or disk for the requested data).

Inventory can be sorted by inventory number or item name. Complete invoicing is available. As invoice data is entered, the corresponding inventory level is deducted. Inventory items can be edited or deleted.

Invoice defaults, (such as shipping charges, taxes, COD charges, etc.), can be changed at any time. Invoices can be printed on the standard ADAM printer or a dot matrix printer.

If you have a small business, INVOICER III may be the program you have been looking for.

AJM SOFTWARE

DISK DOCTOR (D/DP) $9.95 Finally an easy-to-use utility for repairing "damaged' EOS directories: written in fast, machine code. Great help in recovering damaged or corrupted directories as well as in recovering data on bad blocks.

E.O.S. FILE INDEXER (D/DP) $9.95 In a flash, this fine program will sort your EOS directories by reading your ddp or disk directories and compiling a database. It can even store and sort alphabetically multiple directories into a large file that can be printed or further edited in SmartWRITER.

FILE MANAGER V2.0 (D/DP) $17.95 One of the finest utility programs ever written for the ADAM. 100% machine code program that allows you to:
Edit a disk or tape's directory;
Copy files, (one at a time or in groups);
Delete files, (also one at a time or in groups);
Backup disks or tapes;

Krunch disks or tapes, (free-up directory space by removing unwanted deleted files);
Copy blocks;
Edit Blocks;
Format disks and zero formatted tapes;
Initialize a disk or tape.

File Manager will work with or without a memory expander. User can choose to use all of the available expander as a copy buffer, (up to the first 512K); use only the first 64K bank; or ignore expansion RAM. Also works with any size disk drive, (160K, 256K, 320K and 720K).

Comes with informative 25 page manual.

COLECO ELECTRONICS

ADAMCALC (D/DP) $29.95 The affordable Advanced Electronic Spreadsheet. Helps forecast business profits, plan a portfolio of stocks, bonds and IRA's, create a family budget, work out income taxes, etc. Fully SmartKEY driven with over a hundred pages in the manual. (There is a patch available for making printout via the DM printer. See the **ADAMCALC PATCH** under **TC SOFTWARE**, below).

ELECTRONIC FLASHCARD MAKER (DP) $9.95 An easy to use productivity tool that can boost grades and improve classroom performance. **FLASHCARD MAKER** puts you in command of the information you need to master any subject from English to geography.

EXPERTYPE (DP) $9.95 Creates individualized exercises to help develop speed and accuracy. Improves performance of any typist.

FLASH FACTS: HISTORY (DP) $6.95 Follow the course of American events from "the days of discovery" right up through modern times with Electronic Flashcard Maker. Choose from 22 exciting decks ranging from the year 1490 through 1984, to Presidents to World War I and II.

Learning opportunities:
Increase Knowledge of American History and
Sharpen Memory Skills.

FLASH FACTS: VOCABULATOR (DP) $6.95 Now use ADAM to develop your vocabulary with Electronic Flashcard Maker. Choose from 25 exciting flashcard decks ranging from Places to Scrambled to Opposites.

Learning opportunities:
Expand Vocab,
Improve Writing Skills,
Sharpen Memory Skills.

RECIPE FILER (DP) $9.95 Quickly organize and plan exciting, nutritious family meals! Store and cross-file favorites in three ways.

Databases created can hold up to 150 different recipes. Access any one in moments. Printout recipes, plus ingredient shopping lists.

RICHARD SCARRY'S BEST ELECTRONIC WORDBOOK EVER (DP) $15.95 Over the years, millions of children have learned from and loved the books of world famous author and illustrator Richard Scarry. Now, for the first time, his charming characters actually come alive through the magic of computer animation! Four structured skill levels: exploration, matching, pairing words with pictures and scavenger hunt.

Learning opportunities:
Increase reading Readiness Skills,
Expands Sight Vocabulary and
Builds Object Recognition.

Ages 5-8. Contains the most amazing graphics and sound you will ever see in any ADAM program.

SmartFILER Revision 270 (DP) $9.95 Database program for storing all of your key records in one convenient place, and find vital information fast.

Use it for home or business inventory, Student notes, Mailing List, Collection File, etc.

SmartLETTERS & FORMS (DP) $9.95 Takes the hard work and worry out of writing letters.

Contains hundreds of pre-written sample business and personal letters; thank you notes, invitations, resumes, complaints, and many others!

SmartLOGO (DP) $15.95 Logo is the critically-acclaimed programming language that's considered the ideal first computer language. SmartLOGO is designed to conform to the way children think.

DATA DOCTOR

QUICKPAK QUEST (D/DP) $16.95 Three academic quizzes, includes study modes, (on-screen and hardcopy).

Quizzes include:
U.S. Capitals,
World Capitals and
Chemistry Elements.

SmartBEST V1.0 (D/DP) $14.95 Makes several improvements to

SmartBASIC V1.0 including a "relative RESTORE" command, instant screen color changes, and sound commands; not compatible with Intel-BEST 3.3. ("BEST" is an acronym for Basic Enhancement for Sound and Text).

SmartTRIX (D/DP) $27.95 Ten user friendly programming aids: two sprite programs, tape or disk modifier, sound effects, 60 page manual, disk and ddp versions not compatible. Great combined with SmartBEST V1.0.

DIGITAL EXPRESS INC.

CLIPPER (D/DP) $15.95 This utility allows you to design clip art pictures, (64 by 64 pixels), or capture them from hi-res pictures. Foreground and background drawing. Store clip art binary image and color data as a Z80 file or as a basic 'H' file. Includes 11K of ramdisk storage space, (does NOT require 64K card); totally Z80 ML program.

FontPOWER (D/DP) $14.95 Very easy-to-use font design utility that even comes with 8 new font sets; (script, micro, cory, roman, bold, etc.). Includes three hi-res font shape tables. Includes a BASIC program that allows the user to insert FontPOWER characters inside the GR, HGR, or HGR2 graphics window.

G.A.M.E. SET #1 (D/DP) $12.95 Two volumes (2 disks or 2 data packs) with a total of 14 entertaining songs and colorful hi-res pictures. Good entertainment. Great for showing off your ADAM system. Very USEFUL for recording as video tape headers.

G.A.M.E. SET #2 (D/DP) $12.95 14 more great music and graphic combinations for bringing out the best in your ADAM. Sound and graphics quality you have to see and hear to believe.

Intel-BEST V3.3 (D/DP) $18.95 A complete SmartBASIC V1.0 enhancement program. Includes: programming command shortcuts, DATA/REM spacebump bug fixed, one color code chart, expanded line size, expanded poke limit, a system block-read or block-write routine, instant background color changes, relative DATA line restoration, powerful audio enhancements, extensive owner's manual, and much, much more.

Intel-LOAD V1.0 (D/DP) $12.95 For use only with SmartBASIC V1.0. This is a SPEED-LOADER program which allows one to drastically reduce loading time required for SmartBASIC V1.0 programs.

The speed savings can be as much as being able to load a program in 1/12the the normal time. Example: a 24K program saved normally in SmartBASIC V1.0 will take a little longer than 4 minutes to load from data pack. Intel-LOAD will accomplish the same task in just about 30 seconds. Very easy to use even for a new computer user. Everybody that has an ADAM should have this.

Intel-LOAD V2.0 (D/DP) $15.95 For use with SmartBASIC V2.0. Same exact program as above, but made specifically for use with SmartBASIC V2.0 and will only operate in Standard Memory, (STDMEM).

MegaDISK V1.0 (D/DP) $19.95 (Memory Expander Required) Creates a Ramdisk utility for SmartBASIC V1.0 or standard EOS programs, works with any size memory expansion RAM card (64K, 128K, 256K, 512K, 768K or 1024K) - it automatically adjusts to the size of your Ramdisk in accordance with your RAM size. Stored as a machine code program and is packed with so much.

PaintAIDE with the SHIFT FONT KIT (D/DP) $16.95 PowerPAINT is a very comprehensive graphics design program that is widely acclaimed as one of the best programs ever written for the ADAM. So, what could make it better?

PaintAIDE allows you to enable or disable the printer status check for your dot matrix printer.

You can select your own default background color for CLEAR; and, best of all you can pick your own pre-defined typeface for the four sets of SPECIAL FONTS.

With "half width" you can setup for MICRO fonts or, (even better yet), SYSTEM fonts. With "full width", you can setup for COMPU, MICRO, or SYSTEM fonts. Plus, you have six double sized (headline) typefaces to choose from: BIG, BOLD, COMPU, GOTHIC, OUTLINE, or RITZ.

PaintAIDE requires two drives. Insert PaintAIDE in one and PowerPAINT in the other. Select the options that you want, and it will change the PowerPAINT medium for you fast. The changes will be in effect when you boot the disk or data pack. You may change them later if you wish.

Comes complete with the SHIFT FONT KIT. Includes 20 sets of font sets; (SYSTEM, BOLD, RITZ, SCRIPT, MODERN, ITALIC, OLD ENGLISH, OLD WEST, BOLD2, STOP, COMPU, ROMAN, BLOCK GOTHIC); etc. You have a total of over 3 dozen font files from which to choose.

PowerPAINT (D/DP) $29.95 (Memory Expander Required) The most EXTENSIVE graphics design package ever developed for the ADAM; quick global color changes; easy polygons; allows use of FontPOWER font sets (normal size, double width, or double length); allows use of CLIPPER clip art files; move and/or copy sections of your pictures; over two dozen print options; (various lengths, various widths, mirror image, reverse image, sectional hard-copy); enlarge sections of your picture; scroll your picture up, down, left or right; actual picture is four screens allowing for large graphics designs; (letter-heads, greeting cards, certificates, etc.); total

machine code program; for printing, a Centronics parallel interface, EPSON FX or IBM 5152 compatible dot matrix printer is required. (A Panasonic qulifies).

For those of you who want the VERY BEST, then this powerful program is just what you have been looking for. This is simply the finest graphics program available for the ADAM. (See the chapter GRAPHICS WITH POWERPAINT in this ASG).

ShowOFF I (D/DP) $18.95 This is one of the most complete graphic design programs ever written for the ADAM. You can print out the low resolution graphics on the ADAM printer or high resolution graphics with a dot matrix printer. ShowOFF I includes 2 programs: BlockPAINT and SmartPAINT, for the artist in all of us.

ShowOFF II (D/DP) $14.95 (Memory Expander Required) Also known as WriterMATE. Is an extensive patch and update to the SmartWRITER Word Processor, which comes already "built in" to the ADAM. Simple is this best update available for SmartWRITER. One can create some very impressive documents, (includes auto justification, 32 embedded print commands and much more).

This program requires at least a 64K Memory Expander and a Panasonic KX-P1080, 1080i, or 1180.

SpritePOWER (D/DP) $15.95 This totally Z80 machine code program, (a 36K file), comes complete with an extensive instruction manual that tells you all about using the program and using sprites in your own programs.

Design sprites on a grid or capture them from hi-res pictures; includes buffer for transferring sprites from one file to another; includes an 11K ramdisk, (which does NOT require 64K expander).

Store the sets as binary image Z80 file, binary image BASIC 'B' files, or as a BASIC 'A' file with DATA statements.

Comes with PUFF, (a fast action arcade style game using sprites).

SwiftDISK (D/DP) $12.95 (Memory Expander Required) Fools the ADAM operating system into believing that the superfast ramdisk is a second data drive. Great for SmartWRITER, ADAMCalc, SmartBASIC, SmartLOGO and many others. Requires MegaDISK 1.0 and at least a 64K Memory Expander, (works best with a 128K or larger expander).

SwiftPRINT (D/DP) $15.95 (Memory Expander Required) Powerful graphics file interchange program which easily converts picture files between RLR, SmartPAINT, PowerPAINT, GraphixPAINTER and PaintMASTER. Store and load in virtual and ADAM picture format.

A variety of picture print options including COLOR for the Okimate 20. Requires a parallel interface and dot matrix printer for printing.

TurboDISK V1.0 (D/DP) $18.95 (Memory Expander Required) Creates a RAMDISK utility for SmartBASIC V1.0, corrects bugs, and includes TurboCOPY (copy utility with 62K buffer and various medium manager options)! TurboDISK is fully compatible with all binary converted SmartBASIC programs and requires a 64K memory expander.

TurboDISK V2.0 (D/DP) $15.95 (Memory Expander Required) Created a RAMDISK utility for SmartBASIC V2.0, uses "d7" to access 63K ramdisk, (1K set aside for the ramdisk directory). It requires 64K or larger memory expander.

IRAMPak I (D/DP) $14.95 (Memory Expander Required) A perfect companion for MegaDISK 1.0 and 64K, 256K and 512K memory expanders. Includes IRboot, (loads SmartBASIC V1.0, ADAMCalc or ADAMLink in about 2 seconds). IRcopy copy utility uses ramdisk space above your files stored there. Pack and Unpack utilities and much more.

K. & T. SOFTWARE

BUSINESS PACK I (D/DP) $18.95 SIX program package designed for a small business. Two programs for customer address lists, two programs for inventory control, one program is used to sort your address files, and one program is used to check your tapes/disks for bad blocks.

SOFTFILER is used to create your address files, and SOFTMAILER II is used for printing.

Up to 248 records per file. Use as many files as your business requires. Three categories can be used for special information such as phone number, ordered, shipped, etc. Records can be sorted by first/last name, or zip code, (great for bulk mailing). If you have a tractor feed, records can be printed continuously.

The other two programs are:
SOFTSTOCK and
STOCKPRINT, inventory control programs. Up to 400 records per file. Use as many files as your business requires.

Keep track of stock number, description, quantity on hand, quantity on order, quantity sold, compaoy cost, and retail cost. A total of your entire inventory is displayed for amount sold, amount on hand at wholesale, and amount on hand at retail. All inventory items will be displayed to the screen/printer, as well as only those that need re-ordering.

SOFTPACK I (D/DP) $18.95 Contains the following programs:

SOFTCHECK- Complete personal checkbook manager, handles Checks, Deposits, Atm's, and Interest Earned. Up to 500 entries per file..

CHECKBOOK TOTALIZER - Program uses files created with SOFTCHECK and gives you a total of any item you choose. All tax deductible entries can be totaled by just entering 'tax'.

CHECKBOOK RECONCILER - Uses your CURRENT checkbook file and compares it with your Bank Statement.

SOFTMAILER -You will never have to address envelopes or print mailing labels again. Create address files of up to 150 records. Print/display by first name, last name, or zip code. All programs are very easy to use, and contain printer output.

KIKIOR GRAPHICS

YULE TOOLS I (D/DP) $16.95 A full 158K of BRAND-NEW graphics files including 15 sprite sets, (480 individual sprites!); 37 clips, (including a full alphabet of giant candy cane letters); and nine full-screen pictures, (including a demo file showing some of the many applications of Yule Tools).

All original work created exclusively for ADAM owners, using only ADAM equipment and software. No "imported" clips, PD files. NO repeats of graphics you've seen elsewhere.

Although Yule Tools I is designed specifically for use with PowerPAINT, the files are compatible with many other graphics programs such as The Print Works, The Label Works, Clipper, SpritePOWER, Swift Label PrintSHOP, Personal Calendar Utility, etc.

FEDERATION SOFTWARE

VISI-SPRITE V6.5 (D/DP) $22.95 This package was designed to facilitate easy use of the incredible power of the Coleco ADAM TMS9918A video chip to create and manipulate sprites on the screen.

Simply put; a sprite, (which appropriately means "a ghost"), is an object that can be defined and placed anywhere on the ADAM video screen, and can be made to appear, disappear, and move about the screen.

A sprite can be any color, and with Visi-Sprite V6.5 it's even possible to create multi-colored sprites; just like in the Coleco Supergames!

This is the most advanced sprite developmeot package developed to date for the ADAM, packing such features as animation tests, multi-colors, flipping the sprite grid horizontally and vertically, buffer area for storing current work, numerous media functions, (IE: load, save, delete, rename, etc.), creation of sprite negatives, the ability to read in sprite data from Coleco Supergames or cartridges which have been copied to disk or ddp. So much more that there isn't enough space to cover all of the included features.

Supports the ADAM printer as well as an Epson or IBM compatible dot matrix printer.

FUTUREVISION

VideoTUNES (D/DP) $21.95 The most advanced music composition program ever developed for the ADAM. Beautiful high-resolution graphic screens depict the empty music sheet with treble and bass clef staffs for your musical score. Enter all types of sheet music or load one of the many included song files to hear what ADAM's sound capabilities really are. On the bottom of the screen are four octaves of piano keys which move into action along with the musical notes when the song is played.

Options include the ability to change the speed of the music, (in quarter notes per minute); the musical key of your song, (default is in the key of C); etc. Entry of notes may be accomplished via keyboard or joystick.

If you are a musician or want to learn more about reading and understanding sheet music, this is a must program, one of the best programs ever developed for the ADAM.

AUTOAID (D/DP) $24.95 Major enhancement made to the SmartBASIC V1.0 program. Numerous bugs are fixed as well as inclusion of a tremendous array of new commands and functions including: auto line numbering, function key definition or MACROs, (lets any key be equal to any group of characters), ability to turn on/off "key clicking", caps lock feature, built-in printer buffer, improved useage of ADAM's soood chip, CALLable assembly language routioes and well as immediate access of memory expanders, (accesses up to 64K). So much more, you'll wonder why this version of SmartBASIC wasn't packaged with the ADAM.

GARY BOOSIER SOFTWARE

TAX HELPER 1990 (D/DP) $19.95 (Memory Expander Required) Having problems figuring out your taxes, well let Tax Helper 1990 do it for you. Supports the followiog forms: 1040, Schedules A, B, D, D-1, SE and U, Form 4137 and most others are supported, but no calculations are performed. Tax data may be saved to disk/ddp for later use. Printing of the forms

and calculation results to the ADAM Printer, dot matrix printer, the screen or a SmartWRITER file. Tax data which is saved will be accessible by yearly updates of Tax Helper.

GERLACH FAMILY SOFTWARE

HAPPY CLIPS VOL. 1 TO 5 (D/DP) $10.95 EACH These five volumes of clip-art files contains some of the finest clip-art pictures ever designed for use on the ADAM. Each volume contains between 30 to 60 clip-art files for use with PowerPAINT and CLIPPER by Digital Express or THE PRINT WORKS and THE LABEL WORKS by Walters Software Co.
Each volume is sold separately, 5 volumes to choose from in all.

HAL HELPER SOFTWARE

ADAMCOLORS (D/DP) $15.95 Learn how to POKE into ADAM to get multi-color text, text graphics, LO-RES and text graphics, plates and the secret color code. Blend HGR for 255 pastel quality colors.

EL ESPANOL (D/DP) $15.95 A head-to-head tutor game. Build your Spanish vocabulary while racing to build condos in Miami. Words grouped by parse and lists are easily expanded. Choose "smarts level", (levels are from "drill" to "fluent linguist"), with printout for the serious achiever. DATA CHECKER program also included which makes creation of word lists easy.

FRANCAIS POUR LES CHIC (D/DP) $15.95 A head-to-head tutor game. Build your French vocabulary while racing to restore the Eiffel Tower and Notre Dame Cathedral in France. Words grouped by parse, and lists are easily expanded. Choose "smarts level", (levels are "drill" to "fluent linguist"), with printout for the serious achiever. DATA CHECKER program also included which makes word lists creation easy.

MATH MENTOR (D/DP) $15.95 Fun way for kids to master arithmetic by building hotels, cities, armies or by hunting elephants.

The Wonderful Wizard of Wits relates how the Great Swami invented numbers and reveals all secrets in "Beating the System". Four exciting games sharpen skills. Included are head-to-head drills: The Great Elephant Roundup, The Arms Race, The Banker and The Hotel. Pre-game coaching, practice drills and printouts are available for achievers.

MINDPOWER (D/DP) $15.95 A dynamic tutorial applying the latest tools of psychology to teach you how to develop a super memory. A few hours will enable you to do things such as drawing the U.S. map and plotting the solar system from memory. A must for students, scientists and executive aspirants! A hardcopy map and state data printout comes with the program.

MUSICPRO (D/DP) $15.95 Learn how to program music the fast way using simple basic machine language data and music maps. ENCODER PRINTSHOP, MUSICQUIZ and HAL'S HELPER top off a comprehensive course.

STATES RACE (D/DP) $15.95 Two candidates battle for electoral votes by learning the state capitals and their locations while marking the campaign tours on a map. Includes tutorial on HOW TO MERGE graphics, text and music and THE CABINETMAKER, a head-to-head game on the '89 Bush cabinet.

STRUCTURAL ANALYSIS (D/DP) $15.95 Computes correct sizes for structural wood members from given loads and spans. Standard methods to calculate load and stresses are explained with graphics. Allowable load tables/typical materials and truss analysis are covered. Written by a P.E. specifically for novice designers.

Includes T.V. TUNEUP, a Hal Helper to align and fine tune your T.V. to optimize color, focus, grid and linearity and also ADAMCOLORS.

HARRISON PRODUCTIVITY

ACCESSING VRAM (BOOK) $12.95 A detailed explanation of the Video Display Processor (VRAM) covering 15 pages which explains how to set-up the two easiest and most used graphic modes (GM 1 & 2). Each of these graphic modes outlines the PATTERN, COLOR and NAME tables as if the programmer is accessing VRAM in SmartBASIC. There are charts showing how to position your image in the NAME table and charts showing how to design your own bit mapped images. Examples are given not only in discussion, but also in SmartBASIC and Z-80 program code.

MASTERING MUSIC (D/DP) $9.95 A SmartKEY driven demonstration program, (looks like a Coleco original), showing what can be accomplished when one masters the complicated sound routines that are included in the BOS system. The included documentation files explain what each of these sound routines does and how to set-up each routine before CALLing them. The demoostration program contains 12 demo songs and 25 soond effects from Coleco software. This software is a giant step forward in the process of learning how to control and use the sound chip's capabilities.

MEIACE SOFTWARE

COPIT (D/DP) $10.00 This is a copy program that allows you to

copy entire disks or tapes. The program will also allow you to copy single files or several files at a time. The files can be copied in any order you want. This program supports a ramdisk and recognizes both tape drives and disk drives 1 thru 4. When copying from the ramdisk, you can make one copy or two copies at the same time.

FORMAT (D/DP) $10.00 This is a format program that allows you to format, initialize, and even put a custom boot on your disks. You can format in up to 8 different disk drives at one time, (if you upgrade your disk drive eprom). You can control each of these disk drives at any time regardless of what the other disk drives are doing.

SmartWRITER HELPER (D/DP) $10.00 This program allows you to use the SmartWRITER Word Processor, and without leaving SmartWRITER, switch to use either the ADAM Printer or a Dot Matrix Printer. You can also switch between a ramdisk and tape drive two. The other added help is, you can use disk drive two or tape drive one by switching back and forth too. This means that you have the use of two disk drives while in SmartWRITER or having to switch disks.

KINKLE PUBLICATIONS

HACKER'S GUIDE TO ADAM VOL. I (BOOK) $11.95 Detailed look at the operation of the Coleco ADAM Family Computer System, hardware and software. Operating system routines are identified and a few instructions given to use them to control the data and disk drives, printer, video, sound and keyboard. Printout of the expansion connectors are given for your own hardware projects. Z80 assembly language is described. Numerous utility program listings included.

HACKER'S GUIDE TO ADAM VOL. II (BOOK) $11.95 The second in a series of in-depth studies of the Coleco ADAM Computer. This is a must for every serious ADAM owner's library especially if you program in SmartBASIC! It continues with more of what's is in the first book plus new material. Basic overview, zero page, keywords, math routines, basic commands, screen and data/disk drive routines, schematics, etc. Numerous utility and demo program listings included.

HACKER'S GUIDE TO ADAM VOL. I & II PROGRAMS (D/DP) $5.00 Contains all the programs which are listed in both volumes of the Hacker's Guide books all ready to use. Save yourself countless hours and headaches by not having to type in the programs yourself.

IMAGE MICROCORP

THE STOCK MARKET GAME (D/DP) $15.95 Aboard style game for 1 to 4 players. The program is a model of the stock market. You can buy and sell shares. Four graphic displays, (DOW-JONES, STOCK CHARTS, PORTFOLIO, and BIG BOARD). Great game if you know how the stock market works. Great educational game and tool to learn about the market.

KERKO SOFTWARE

SmartTERM V1.02 (D/DP) $15.95 This is an advanced telecommunications package for use strictly with the Coleco ADAMLINK 300 Baud Internal Modem.

Features included are:
40 column screen,
multi-tasking buffer to ensure you don't miss a character,
going from terminal mode to command mode and back does not cause lose of screen text,
9K controllable capture buffer to allow printing or later viewing of text,
save parameters and phone numbers permanently, (up to 18), for easy access and to save having to look them up,
multiple screen color options,
provide a file directory when transferring files,
can transfer 'B' and 'A' type files as well as any other standard DOS file,
format disks while on-line as well as offers a
full array of file functions such as: delete, rename, recover, etc. Works with either the ADAM printer or a dot matrix printer. A terrrific DOS telecom' program!

LBS SOFTWARE

ADAMTALK V1.1 (D/DP) $19.95 Excellent program for all who have the Eve SS-CC Speech Synthesizer. It is difficult and time consuming to construct the phonemes and allophones required to drive the speech synthesizer yourself, so let ADAMTALK do it for you. Includes demonstration files.

LAS VEGAS A.U.G.

L.V.A.C. ARCHIVES I (D/DP) $9.95 Ten unique SmartBASIC programs which are of outstanding quality:
SNAKE EYES - Graphic dice game,
MATCH'EM - Concentration type game,
LETTER MATCH - Mastermind with 3 levels,
MORSE CODE - Learn morse code,
CATALOG P/O - Create catalogs,
COLOR POKES - Teach use of color with text,
CARD TRICK - Cards are graphically displayed in text,
I.Q. TEST - Measure your I.Q. accurately,
TRIVIA GAME - Comes with 50 TV questions,
TRIVIA MAKER - Create your own questions for use with Trivia Game.

M & M SOFTWARE

M&M GRAPHICS (D/DP) $9.95 This disk is incredible! With over 106 graphics to choose from, it beats any graphics disk for you ADAM printer on the market by far. It has everything from an impressive SEMI to an adorable TEDDY BEAR. There are flowers to food, clothing to cutlery, animals to arrows. An on and on! Use it to design invitations, party hats, placemats and banners for your next party, etc. Create unique fliers or stationary. Let your imagination run wild with this extensive selection of graphic files for use with SignSHOP or NewsMAKER, (by STRATEGIC SOFTWARE INC).

SMILEY FACE: WHAT AN ATTITUDE! (D/DP) $9.95 If you thought that SMILEY was always happy... THINK AGAIN! M&M SOFTWARE has created a new and exciting way to express yourself. SMILEY has 70 surprising mood swings, from AGGRESSIVE to WITHDRAWN. You'll have fun finding ways to use these 70 unique clips. It's compatible with CLIPPER, PowerPAINT, THE LABEL WORKS, THE PRINT WORKS and any other programs which support clip-art files. One of the most original graphic packages ever developed. It's great!

M.M.S.G. SOFTWARE

BACKUP 3.0 (D) $10.95 Copy all ADAM software. Fully supports systems with/without a memory expander (102K/40K copy buffers), Automatically tests internal and expansion ram memory when loaded, FORMAT DISKS with/without verify, Makes image copies of ANY media including 'short tapes'. Supports mixed tape formats, identifies and optionally skips bad blocks, Makes full use of 'SMART KEYS'.

COPYCART+ D2.0 (D) $19.95 The latest version of the popular cartridge copy program. Contains all of the features of COPYCART+ plus: allows cartridges to be written to tape or ANY SIZE DISK; FORMATS disks from within the program, user can specify volume size, EXPANDING directory on Target media; Single key cartridge selection from game controller. Copies full 32K cartridges, Uses standard directory entries for cartridge files, (this allows game files to be transferred via a file copier), extensive error detection/reporting capability, formats and disks from within the program as well as file deletion. Allows 4 - 16K cartridges on a single 720K Disk.

EASY COME, EASY GO (D/DP) $19.95 Comprehensive savings & loan program. Have you ever wanted to know: how much financing a car or home really costs you, how changes in INTEREST, PRINCIPLE, or TERMS of a loan affect the monthly payment or total amount you pay? The effective interest rate when you re-finance a loan and pay points? The remaining principal on a loan so you can determine the payoff? The future worth of regular deposits in a savings account? The amount you would have to invest to make regular withdrawals in the future? The amount you would to have to invest today to be worth the amount you want to be worth in the future?

EASY COME-EASY GO can help you answer these financial questions and much more.

MURDOCK GAMES

PRO PICKS (D/DP) $18.95 Allows one to predict the results of pro football games based on point spread or the over / under total. Maintains a database using stats that are entered from the sports page of the newspaper. The program uses these numbers to give you a complete rundown of the game that you select.

The results can be displayed on the screen or can be printed out for future use.

SpriteMASTER (D/DP) $18.95 Allows for the creation and use of sprites in one's own programs without having to learn complicated machine language routines. SpriteMaster contains programs that automatically modify and create machine language files that one can load into programs with just a few short commands. This saves both time and memory in programs. Saves hours of calculating and typing complicated machine code.

Creates sprites, writes code and prints out locations in memory for you, allowing you to manipulate sprites with ease.

MR. T. SOFTWARE

ADDRESS BOOK / CALENDAR (D/DP) $9.95 Keep track of the names, addresses and phone numbers of friends, relatives, business associates, etc. Contains fourteen books that will hold 150 names each. This also comes with a bonus program, YOUR COMPUTER CALENDAR, which will display or print a one month calendar.

AUTOWRITER (D/DP) $14.95 This is a unique and exceptionally useful aide for the experienced programmer and a fun learning tool for the beginner. AUTOWRITER comes with a 19 page manual full of helpful information and complete instructions for using the software.

Using ADAM's SmartKEYS, AUTOWRITER is a menu driven utility that writes machine code routines and basic sub-routines to a user designated data pack or disk. It creates an "A" file that can be loaded and listed, then merged with an existing program, or used as a base for a new creation.

An added feature is that it contains a comprehensive list of

Pokes and Calls complete with useful suggestions, tips, fixes and enhancements for SmartBASIC V1.0. Instructions for using the PEEK, POKE and CALL commands and merging are included in the manual. This is a MUST HAVE for anyone who plans on programming in SmartBASIC.

BASICaide V2.0 (D/DP) $9.95 Another BEST VALUE as reviewed throughout the country, BASICaide installs new commands, macros, switches and loads of other features and basic corrections. BSAVE your programs easily in a fast loading format with the BIN command - CHAIN your programs together and EXTEXT into a 40 column mode instantly. Recover "h" files, BRUN from any drive, put spaces in file names, and enjoy 21 single key press and control enhancements.

Other features include: automatic random numbers, DATA and REM space bump correction, actual blocks left and used in CATALOG, help screen, and complete instructions.

Create programs easier and BRUN them faster with BASICaide.

KID'S TRIVIA PACK I (D/DP) $12.95 Contains 1000 questions and answers in 6 categories. The program randomly selects one of the six categories for you and displays the question. Very nice graphics, colors and sound are used to make this a great game for those who enjoy trivia. It's GREAT. Geared towards the junior high school through high school student. Up to four players may compete against one another.

MR. T LIBRARY (D/DP) $10.95 A media library and maintenance program which reads your data packs or disks, and records the contents under one of eight categories for viewing or printing with the ADAM or Dot Matrix Printers. The library can be easily added to, and edited; and may be printed out by volume title or by programs in alphabetical order.

Will also lock your files, clean your directories, rename your volumes and print labels. Each category will hold up to 40 volumes and up to 350 files.

MIAD GOLD: HOME & BUSINESS (D/DP) $9.95 Contains ALL OF THE FOLLOWING:

ADAMBASE - A true data base that allows you to define, sort and store records.

ADDRESSER - Address small or large envelopes quickly and easily.

VCR - Create title screens for your VCR tapes showing the movie's name and counter number.

LABELMAKER - Program allows you to store your labels on disk/tape and recall them later.

CASSLABEL - Creates a nicely formatted full size label with cutting marks for your cassettes and data packs.

MAILLIST - Keep track of all your addresses. Sort, edit and store all entries.

MORTGAGE - Prints schedules and reports on amortized loans.

CALENDAR - Program prints an interesting and personalized 12 month calendar.

ANNOUNCE - Program prints a 1 page announcement; left, right, or center justified.

SORT - Enter any list and the program will sort it and print it out.

SHOPPING - Prompts for items then prints out a shopping list.

PHONEBOOK - Put your phone numbers on ADAM then sort, edit or print the list.

BYRBARGRPH - Create graphic screen bargraphs with titles.

PHONECOST - Program times your phone call and lets you know how much money you spent.

PERSBALSHT -Keep track monthly of your personal financial worth.

BANNER - Create any size party or poster banner with different characters on your ADAM printer.

INVENTORY - Create a permanent inventory of all your possessions quickly and easily.

LOANALYSIS - Calculate loan costs and interest income.

DRIVENUMB - Interesting program determines your driver's license number for most states.

MIAD GOLD: SCIENCE & EDUCATION (D/DP) $9.95 Contains ALL OF THE FOLLOWING:

CONSTELLAT - Great program that displays the stars for 12 constellations and pertinent information.

DICE - Randomly displays the face of 2 die in graphics.

LIFE - This program graphically displays the effects of population density on cells.

PLANETS - Loaded with information on the planets and then draws them to scale.

TYPEDRILL - Learn the keyboard or increase your typing speed.

AVERAGES - Enter a list of numbers and the computer will print or display the list with total and average.

MORSECODE - Have fun learning morse code.

PRESCHOOL - Teaches youngsters numbers, letters, shapes and colors.

USCITYQUIZ - Tests you on the major cities.

USPRESQUIZ - How well do you know the presidents?

NUMBERFAI - Discover all the characteristics of any number, (factors, etc.).

PLANETLBS - Program will tell you how much you would weigh on another planet.

MULTIPLY - Learn your multiplication tables.

ADDITION - Pick your difficulty level and go - you have 30 seconds to answer.

CALCULATER - Performs all the functions of a simple calculator.

GRAVITY - Interesting game/demonstration of the gravitational pull of planets.

ESP - Using the graphic cards, find out how much ESP you

have!

CONVERTER - Convert units of length, area, volume, mass, velocity and pressure.

ALC-CALC - Test your reflexes or your blood alcohol content whether you've had a drink or not.

HEXCONVERT - Convert hex numbers into decimal.

FIRESAFETY - Test your knowledge of fire safety.

SPANISH-A Spanish vocabulary quiz with a grade at the end.

USAMAP - A well done graphics display of the good 'ole USA.

MIAD GOLD: UTILITIES (D/DP) $9.95 Contains ALL OF THE FOLLOWING:

FILEMGR2.1 - Copy files or blocks, make backup copies or edit your directories.

UTILDUMP - Great utility converts numbers, edit directories, dumps memory or blocks to printer, or screen in hex, decimal and ASCII.

RENAMEVOL - Renames your disk or tape without INITing.

CATCLEAR - Removes deleted files from your directories.

MERGE - Enables you to merge 2 or more programs.

ZIPATCH - Patch your SmartBASIC backup with routines or common (color, drive) patches.

SCRUNCH - Recover lost space on your tape or disk, and move all your files to the front of your directories.

RAMDATE - Changes the ram date so your SAVED files have the correct dates.

HEX-DEC - Convert hex numbers to decimal and display the low and high bytes of the number.

DIRSIZER - INITs your tape or disk to hold up to 230 files!

CLEANUP - Renumbers your completed program lines.

UTILCOPY - Full copy utility for making backups.

LOOKSHAPES - Tutorial on shape tables and actually finds, defines and displays any shapes.

M.I.A.D. SOFTWARE / SERVICES

ADAMCON #1 VHS VIDEO (HW) $19.95 2 hour video tape covering product demos and seminars that were held as the first ADAM Convention in Orlando, Florida from October 7th-11th, 1990.

BASIC BASIC PROGRAMS FOR THE ADAM (BOOK) $8.25 Published by TAB Books. A treasury of practical and entertaining programs that take full advantage of ADAM's sound, color and graphics! Includes full program listings, illustrations, and explanatory notes. The ideal guide to take you beyond the game that comes packaged with ADAM, this is your key to discovering how easy it really can be to master SmartBASIC...and how easy it can be to write your own software programs.

DATA PACK CONVERSION TO DISK FORMAT (D) $4.00 Send in your title card from your Coleco data pack to be converted to disk. Titles which can be converted are: Buck Rogers, Donkey Kong, Donkey Kong Jr., Dragon's Lair, Zaxxon, Recipe Filer, 2010: The Text Adventure, Richard Scarry's Best Electronic Wordbook Ever (320K or 720K disk only), The Best of B.C., SmartLetters & Forms, CP/M 2.2.

If you see a program listed that you can't reproduce into a working copy on disk, call during regular business hours to see if we can do so for you.

GRAPHIXPAINTER (D/DP) $19.95 This program is a graphics print utility for parallel dot matrix printers, which allows printing of ADAM's SmartBASIC screens, (both High/Low Res), saving and loading graphic files/pictures and converting Run Length Encoded, (RLE), digitized pictures to ADAM SmartBASIC Hi-Res graphics.

A printer driver is also included which will allow you to generate graphics commands directly to your dot matrix printer. Picture file format compatible with PowerPAINT.

GRAPHIXPIX I (D/DP) $14.95 This program does not require a dot matrix printer, but rather is a set of high resolution graphic display utilities. Save your High/Low-Res screen graphics. Utilities for converting SmartBASIC graphic screens to a file that can be read by PaintMASTER. This feature will greatly enhance the use of PaintMASTER.

M.I.A.D. PRODUCT REVIEW BOOK (BOOK) $19.95 Contains detailed reviews of over 100 ADAM products previously printed in the MIAD Newsletters dating from January 1985 through December 1987. Save money by having reviews of products at your finger tips.

M.I.A.D. PUBLIC DOMAIN REVIEW BOOK (BOOK) $5.00 Contains detailed listings of all the programs in each of the SmartBASIC HMDV, SmartBASIC Utilities UMDV and SmartLOGO LMDV public domain libraries. Each volume is listed seperate and lists program name, file type, size in blocks and a short description as well as total number of files and volume size.

M.I.A.D. YEAR IN REVIEW: 1985 (BOOK) $9.95 A 32 page book of ADAM product reviews which were published in the January 1985 through December 1985 M.I.A.D. Newsletters. Great money and time saver as well as reference.

SmartFILER UPGRADE to Version 27D (D/DP) $4.00 Send in your SmartFILER DDP or Disk to be upgraded to the lastest version 27D which fixes many of the known bugs.

PHOENIX 2000

PERSONAL CALENDAR UTILITY (D/DP) $19.95 (Memory Expander Required) Tremendous calendar creation program for the ADAM. Performs on-line calendar and calendar calculations. PCU has

a variety of calendar printing options. For the ADAM Printer or a DMP, it will print a year at a glance hardcopy. For a system with a DMP and at least a 64K expander, it will print graphic calendars for any month.

With the one month option, print a full page calendar with room for automatic notes on dates, clip-art stamping, assorted typeface text entry, monthly events list at page bottom, multitude of graphic border choices.

PCU will produce some dazzling graphic calendars and also allows for the saving of calendars in a PowerPAINT compatible format for further editing and printing options.

SWIFT'S LABEL PRINTSHOP (D/DP) $19.95 (Memory Expander Required) Written specifically for creating various sizes of hi-res graphic labels AND fancy text labels which utilize different character pitches and numerous other software commands that are in the firmware of most Dot Matrix Printers. Turn your system into a professional quality label generating machine. This package is the non-database label generating program for the ADAM. With two distinct design modes, text-only and graphics with text, (three size options); you can create impressive labels in various sizes quickly and easily.

Comes complete with a number of additional clip-art, border and font files to be used in your own labels which are created in a WYSIWYG, (What You See Is What You Get), environment with on-screen vertical and horizontal rulers. Text only labels can be printed on the ADAM printer, not graphic labels.

PRACTICAL PROGRAMS

BASIC SYSTEM MGR. V3.0 / FASTRUN V2.1 (D/DP) $18.95 A neatly packaged set of improved and additional SmartBASIC utilities placed with a shell program. Main display shows current drive, free space remaining, volume name, system date and all directory filenames.

Internal help screens, rename volumes, read protect or read enable files, (password protect), recover files, change screen and border colors, delete or un-delete files, run SmartBASIC programs directly from the shell program, print catalogs or catalog labels, initialize or de-initialize, extensive error checking.

Fastrun is used for storing your SmartBASIC V1.0 programs up to 4 times faster than using the 'SAVE" command. The binary programs, made by Fastrun, may then be loaded up to 11 times faster than using the "LOAD" command.

The ultimate SmartBASIC V1.0 utility package! Makes using SmartBASIC a dream.

PARALLEL SYSTEMS / TUTORWARE

ADAM TUTOR (DP) $9.95 This menu driven program is a tutorial of 4 separate teaching modules.

Various modules cover the many facets of ADAM including Basic programming, control keys, print zones and much more.

CHESS TUTOR I (DP) $9.95 The chessboard, pieces and moves are covered in detail. A comprehensive booklet is provided.

CHESS TUTOR II (DP) $9.95 Created as a supplement to Chess Tutor I. May be used alone by those with a basic knowledge of chess.

WORLD CAPITALS (DP) $9.95 Colorful graphics. Clues available. Study mode for beginners. Print a list of 50 countries and their capitals. 2 separate games. Computerized scoring.

READY SOFTWARE

POWERTOOLS (D/DP) $15.95 This is a "must have" package for users of Digital Express' PowerPAINT.

The idea behind POWERTOOLS is to provide you with a variety of graphics tools which you will find useful from the moment you open the package, but which are also so flexible that they will continue to intrigue you for years to come.

There are literally dozens of graphic files on this medium: 17 sprite set files, (including three big "font" sets); 55 clip-art files, (including a set of huge Gotham "font" clips); many versatile brush files; full screen pictures; three ".fat" font sets, (DelRio, Philly, and Detail); and a Christmas Tree Construction Set.

POWERTOOLS also includes a very informative instruction manual that details the use of all of the files, and includes many useful ideas for getting the most out of PowerPAINT.

READY SOFTWARE LIBRARY (D/DP) $17.95 Includes an assortment of SmartBASIC programs:

NICHIGAMA JONES - a fun text adventure game,

VIDEOPAINT - paint and save low-resolution pictures,

TEXTEDITOR - print text in HGR screens,

PICTURE SUBROUTINE MAKER, and more.

A modest knowledge of SmartBASIC may be needed to utilize the

TextEditor and picture routines into your own programs.

ROADRUNNER PUBLICATIONS

FROM BASICS TO BASIC (BOOK) $15.00 A beginners look at a computer. Follows the development of the modern computer, and in the process, develops the solutions to the problems which the scientists faced. The reader will finish this book with an understanding sufficient to allow him to begin to program computers in the language of the machine. He may then be classified as a beginning 'HACKER'.

Contains thorough explanations of the number systems used in the computer and why they are required, the makeup of the microprocessor and how it works, the way they are used, the RAM's and ROM's and how they work with the microprocessor, and illustrates the use of the machine language instructions in writing a program and submitting it to the microprocessor.

LEARNING TO DRAW WITH ADAM (BOOK) (D/DP) $25.00 The first of two volumes which will deal with graphics in general. It teaches one how to address the video screen via the Z80 microprocessor in all of the four standard modes of the ADAM VDP (TI-9928), which Coleco purchased from Texas Instruments.

The discussioo is ADAM and Z80 oriented, but in general, VDPs can operate with a large variety of host microprocessors. The reader should finish this book, 161 pages in all, not only with a good understanding of how the VDP works, but with considerable practice in it's actual use through the use of the included exercises and the demonstration programs which are included on a disk or data pack.

LEARNING TO READ WITH ADAM (BOOK) $25.00 A discussion of machine language instructions, some specifically, and a great many generally as the author develops the disassemblies of all that transpires after the reset button is activated. The disassemblies are detailed and discuss many of the more curious aspects of several of the machine language instructions as they are being used in the Operating System of the computer.

The object is to study how professional programmers have used the instructions, with a view toward having the reader become more familiar with the usage thereof. The initialization of the Operating System is disassembled as it refines itself after power is applied; and then the initialization routine searches for a media to 'BOOT' into RAM. At this point the author assumes that the media contains SmartBASIC, and the whole process of booting that program and loading it into RAM; and then JUMPing to its operation is followed.

The complete set of Z80 machine language instructions is printed, but without specific comment on each, other than those comments used within the above mentioned disassemblies.

The unique features of this listing, is that the decimal equivalents are given. No other known work provides these decimal values in this type of tabular form; which values are essential to the entering of machine language programs into RAM via SmartBASIC; the most common form of machine language entry for the beginner.

More examples of how to enter machine language programs are given, with the idea of promoting the direct use of existing subroutines in the ADAM ROS by the reader.

LEARNING TO WRITE WITH ADAM (BOOK) (D/DP) $25.00 Assumes that the reader has either become familiar with "From Basics To Basic" and "Learning To Read With ADAM", or has become familiar with that information in some other fashion.

It discusses the manner in which a "write to media" operation is performed by some computers in general, and ADAM in particular. Among the items discussed are the "memory mapped" ports versus standard IN/OUT ports, and how they are used to input and output information.

These "Device Control Blocks" are explored in more detail than done previously, with instructions on how to use them to format a media and write-to or read-from a media, using the Basic language.

Many of the more advanced features of the ADAM's ability to communicate with mass storage are shown, and more of the implicit features of the Master 6801 are discovered. Included are a number of demo programs that are listed in the book ad also come with the book on disk or ddp. The book covers 112 pages.

ROYAL AMBASSADOR SOFTWARE

ROYAL AMBASSADOR EDUCATION PACK (D/DP) $9.95 A collection of 10 SmartBASIC programs. Programs contained in this package include graphic design in low and high resolution with picture files, numerous song files, educational for recognition skills and math drill skills, scramble game dealing with the books of God's Holy Word and much, much more.

SKAMAR SOFTWARE

GROOVY GRAPHICS (D/DP) $14.95 A set of programs which use mathematical techniques to create graphic patterns. One can store the patterns in Run-Length Encoded, (RLE), files to be used with other programs; or you may print them to a dot matrix printer directly from the program. Includes:

CELLS - An adaptation of John Conway's "Game of Life";
LISSAJOUS - a type of curve made by plotting points whose position in one direction is determined by a sine wave, and whose position in the other direction is determined by a different sine wave, usually of a different frequency and phase;
IFS - this stands for Iterated Function System and is a technique for creating fractals. Allows for the creation of some interesting shapes and textures that can be saved and used in other paint programs.

Built-in help screens are included in each phase of the program.

TC SOFTWARE

ADAMCALC PATCH (D/DP) $9.95 This is a SmartBASIC program that will patch a COPY of your ADAMCALC program and allow for the output to your high speed dot matrix printer.

ADAMLINK II PATCH (D/DP) $9.95 A patched version of ADAMLINK II which will allow the use of your dot matrix printer directly from the program.

ADAMLINK III+ (D/DP) $24.95 Greatly enhanced version of the public domain program ADAMLINK II. ADAMLINK III+ now provides for the transmitting or receiving of machine language files such as games, CP/M files or "bsaved" SmartBASIC programs.

Now you will have XMODEM capability, which all major BBS's support.

Other enhancements which have been made are full support of any modem attached to the ADAM: 300 baud internal or 300/1200/2400 baud external Hayes compatible modem attached to the ADAM through a Serial Port; compatibility with 80 column units for a full 80 column text display or retain standard graphics display with SmartKEYS without the 80 column board, (one may also direct output to two monitors at the same time using both viewing modes); compatible with the standard ADAM Printer or a dot matrix printer attached to the ADAM via a Parallel Interface.

ADAMLINK III UPGRADE TO III+ (D/DP) $5.00 Send in your ADAMLINK III data pack or disk to be upgraded to III+. Must be the original ddp or disk and versioo III of ADAMLINK (Version I & II not eligible for complimentary upgrade).

TCH SOFTWARE

LABEL MAKER DELUXE (D) $9.95 This is a simple, but very powerful labeler program that also functions as a database. It allows for the creation of a 90 record database with each record capable of holding 10 different fields that are user definable, full edit features of any record and category, ability to change a category's name, full sorting ability of all categories with user definable search criterion and dot matrix printer support. Complete flexiblity of what fields will be printed as well as how they will be printed and also supports 8 1/2" x 11" label sheets which contain three labels across.

SuperBASIC PLUS (D/DP) $9.95 The one SmartBASIC V1.0 modification that you will not want to be without. Once you have used it, you will never go back to any other version of SB V1.0.

100% compatible with V1.0; numerous bugs have been fixed that were in V1.0 including the DATA and REM spacebump; dot matrix printer support has been added without the need of a patch program; support of any size memory expander with the RAMPOKE command, (works like the 'POKE' command); Window command for splitting up the screen with free-flowing movement of text inside the window; incorporation of function keys into control codes, (IE: Control-C is now ESCAPE, Control-S is now WILD CARD, Control-0 is now DELETE); special command for handling sprite movement that bypasses the need to continuously poke new sprite attributes; screen color commands to change text, border and background colors without having to 'POKE' in new values; sound command for accessing the sound chip.

Right new commands in all that make programming a dream come true in Basic. This is what Coleco's version should have been. A virtual dream come true! TELEGAMES U.S.A.

WALTERS SOFTWARE CO.

ADAM'S DESKTOP (D/DP) $29.95 (CART) $39.95 (Memory Expander Required) Brings a new modern way for ADAM users to use their computer. The EOS operating system is a direct derivative of the OS7 operating system, both of which every ADAM contains. The OS7 was in fact, one of the first graphics operating systems available for any home computer. Take a look at SmartWRITER, it sure contains a lot of graphics, and all done with the EOS operating system.

ADAM'S Desk Top uses a modified EOS operating to bring you a graphics desk top program to make your ADAM work better for you. Options include:
ramdisk setup, init and reset;
Standard ADAM operating system with or without dot matrix printer support,
SmartDSK operating system;
SmartWRITER setup with ramdisk and dot matrix printer;
"Boot tools" that allows you to boot almost any program the ramdisk; A media can now contain as many bootable programs that there is room for;
Copy tools that will backup a larger drive to a smaller

drive by using more than one media; Quick ramdisk load and save options, and more. This is easily the most advanced set of utilties compiled for the ADAM and should be a part of everyone's system, especially on cartridge.

AUTOBACKUP (D/DP) $17.95 (Memory Expander Required) Two unique programs to be used with SmartDSK II or III.
AutoLoad copies the contents of a disk or data pack to the ramdisk.
AutoSave copies the contents of the ramdisk to a disk or data pack. Use any expander, 64K or larger, 160K, 320K, and 720K disk drives.
PrBOOT can also be used with AutoLoad to boot software from the ramdisk.

BordersPLUS (D/DP) $12.95 This package is designed to be used with 'The Print Works'. Includes twelve new custom borders, plus bonus fonts and clips. Great addition for the 'The Print Works'.

CLIP-ART VIEWER (D/DP) $24.95 A terrific utility which aids in converting, cataloging, and viewing clip-art pictures with your ADAM computer. With this program one can view and print a clip-art by selecting it from a catalog. You can view an entire media automatically, and select the display speed. Will also print a catalog of all the clips on a media.

You can also convert IBM PrintSHOP and PrintMASTER clip-art into ADAM clip-art, (as long as you have an IBM with a 5 1/4" 360K disk drive, an ADAM 5 1/4" disk drive and "The ADAM Connection" by White Co.). Converts 2K clips to 1K, and 1K clips to Print Works clips. The SmartDSK ramdisk is also available to save time and drive access.

COLECO GRAPHICS PROCESSOR (CART) $39.95 Coleco's graphics design, (AKA: Project Name by Line), which was first only available on or ddp in the public domain. The cartridge version does not require use of a memory expander, unlike the disk or ddp versions. Also, the cart version includes the option to capture graphic game screens from supergames ddps; disks; or cartridges, (which have been copied to disk/ddp); and from numerous other ADAM software programs. (The disk/ddp version can't perform this screen capture).

This program was used to design the Coleco supergames and some of the later cartridges. A conversion program and instructions are available on the 'Graphics Converter' volume which is public domain.

FORMATTER II (D) $12.95 This is the most comprehensive disk formatter ever written for the ADAM computer. The features include: format disks in one or two drives at the same time; automatic detection of drive size, eliminates manual setting; use any combination of drive sizes, (160K, 320K and 720K); verify option include - read, write, and both read and write; custom volume names can be used; initialize option for disks; volume name and catalog amount; disk status feature; system status checks drives on-line and system size; 100% machine code program with their SmartDSK operating system. Choose one of five screen colors with graphic SmartKEY display. Uses dialog boxes for messages.

First ADAM program to use dialog boxes. A disk drive is REQUIRED.

LIBRARIAN (D/DP) $19.95 Will read the file names from a disk or data pack and store them on a media that SmartFILER can read. Search for file or volume names, room for comments and over 700 files in the SmartFILER database which is herewith created. Requires SmartFILER by Coleco.

MacADAM MANUAL (BOOK) $19.95 An enlightening 72 page manual that aids the user of the public domain program MacADAM with simple, step-by- step, methods of programming macros. That goal continues through out this edition, in hopes that this manual will help those interested in Assembly Language, to explore and expand this interest.

The subroutines and programs in this manual, for the most part, are intended to introduce the new assembly language programmer to some methods of using the commonly available hardware, console, printer, and disk drive(s) associated with the ADAM Computer operating under SmartBASIC or the EOS system.

MacADAM DEMO FILES (D/DP) $5.00 Contains two demo programs for use with MacADAM. Each program is saved as a MacADAM file as well as a SmartBASIC binary file.

MisSPELLER (D/DP) $18.95 This is a complete misspellers dictionary, to be used with SpellingAID. MisSpeller contains over 15,000 of the most commonly misspelled words, in both SmartWRITER and SpellingAID files. You may use the files as is, or create your own custom dictionaries.

PrBOOT (D/DP) $17.95 With PrBOOT's file transfer program, you can save up to six software programs to a Data Pack, Disk, or Ramdisk. You can then boot PrBOOT and select the one you want to use.

Booting programs from the ramdisk with PrBOOT is super fast (SmartBASIC takes about two seconds). Also the convenience of six software programs on a Disk or Pack. Compatible with all SmartDSK and SmartDSK utility program.
RamBOOT (D/DP) $19.95 (Memory Expander Required) With RamBOOT and a 256K expander, (or larger), you can switch between four software programs; SmartWRITER, SmartBASIC 1 & 2, and ADAMCALC. This is done with one keypress operation.

Select programs from the RamBOOT's menu. Hold down the

control key and push the delete key to return to the menu from any program. Programs boot super fast, (about 2 seconds) and all have ramdisk capability.

Printer drivers for dot matrix printers are included for SmartWRITER and SmartBASIC 1 & 2.

SmartKEY (V) is reserved for a utility program, currently being worked on at Walters Software Co. When patched it will provide a complete set of file utilities at the push of the key. RamBOOT can also be set up for a 64K or 128K expander to switch between 2 programs.

SmartBASIC CART (CART) $39.95 Tired of waiting for SmartBASIC to load up, especially from data pack? Well, here is the answer to that long wait. Your favorite version of the Basic programming language can be supplied on cartridge. Simply plug the cartridge into the ADAM and pull the <CARTRIDGE RESET>, basic is loaded up instantaneously!

Any version of basic can be supplied from: SmartBASIC V1.0, French Basic, etc. For commercial copyrighted versions of basic, the original data pack or disk will have to be mailed into us for proof of purchase, (IE: SuperBasic Plus and Superior Basic). Remember to inform us which drive should be setup as the default drive to search for a HELLO program.

This is the ultimate time saver!

SmartDSK I for SmartWRITER (D/DP) $18.95 Uses any memory expander as a high speed ramdisk, with options to use the Adam printer or a dot matrix printer. All SmartWRITER printer features work with a dot matrix printer. Compatible with all SmartDSK utilities. New ramdisk also has more blocks free; one per 64K, 256K expander has 187 blocks free with one bank reserved. New Operating System lets SmartWRITER work faster and smoother. Can be used without an expander just for the dot matrix printer option.

SmartDSK II for Device #2 (D/DP) $16.95 (Memory Expander Required) A ramdisk program for ADAMCALC, Flash Card Maker, and SmartBASIC V1 & V2. Uses drive number two, (tape drive #2), as the ramdisk drive selector, (even if you only have one tape drive). Use ANY MEMORY EXPANDER, (ADAMCALC requires a 128K or larger expander to work correctly).

Copy II utility; Matrix, (dot matrix printer patches for SmartBASIC 1 & 2); and cruncher programs included. Copy II can copy a complete program including the boot block (0) to the ramdisk to be copied back to a Data Pack or Disk.

New ramdisk has more blocks free; full size 256K expander has 250 blocks free, or 252 total blocks. Block 0 can also be used, it is not used as the buffer as with other ramdisk programs.

SmartDSK III for SmartBASIC 1 & 2 (D/DP) $24.95 Package will work with or without a memory expander card. This FANTASTIC PACKAGE contains a Ram Disk that will work with either SmartBASIC 1.0, or SmartBASIC 2.0. Since SmartDSK will work with ANY SIZE memory expander, (up to 1 MEG), this is the only utility package you may ever need.

What does a Ram Disk? A Ram Disk gives you the ability to store and retrieve files directly from dynamic RAM within your computer, (generally using the RAM in the memory expander).

This will give you SUPER FAST access to your favorite programs. For those of you with a BIG memory expansion card, (128K, 256K, 512K, etc.), you can store programs, (files), on the lower portion of the memory card; and then use ANY program that uses the first 64K; and your programs will still be there, (as long as you don't turn the power off).

Enhanced to work with any size ramdisk, as well as 160K, 320K, or 720K Disk Drives, Each of the utility programs are in two different versions. One version works with SmartBASIC 1.0, and the other version works with SmartBASIC 2.0. If you are using a BIG memory expander, the COPY program has been enhanced with a REPEAT copy function. This feature is GREAT for ADAM Users Groups who have a public domain library, and do a lot of copying.

By copying directly from the Ram Disk, copies can be made SUPER FAST, and without wear and tear on the "source drive". For those of you with a dot matrix printer, or if you are planning to purchase one in the future, this pack also contains a printer patch that will allow you to use of your DM printer, from either of the two types of SmartBASIC. You make a copy of your SmartBASIC, then use the enclosed program to permanently patch either version of Basic.

SpellingAID (D/DP) $26.95 This is a super spelling checker. It works with a standard ADAM system or with any size memory expander installed, (up to ONE MEG). (The larger the expander the more words you may have in the dictionary). With a 512K expander card, a 40,000+ word dictionary can be used. Over 12,000 words are included for a standard ADAM system.

Select from 5 different colors for the work screen, add, modify, save and load dictionaries. Check, modify and change words in your files. Checks SmartWRITER, SpeedyWRITE, MultiWRITE, and standard ASCII files. Uses SmartKEY display at the bottom of the screen.

THE LABEL WORKS (D/DP) $24.95 Give your labels that professional look with 'The Label Works'. Include a clip art picture with standard size mailing labels. Four type styles are available: elite, italicize, compressed, and expanded. Text and clips are double striked, giving them a bolder look.

The work space can hold 200 standard size labels and can be saved to tape/disk. Use as many files as you need. A special feature lets you mark labels in the workspace to be printed. Edit and print labels in the work space. Custom label entry features up to 10 lines with 40 characters per line.

This is a 100% machine code program with the SmartDOS Operating System and a ramdisk, (allows the use of a memory expander as a high speed mass data storage drive). An EPSON compatible 9 pin dot matrix printer and parallel interface are REQUIRED.

THE PRINT WORKS (D/DP) $27.95 This is a print shop program for the ADAM and a dot matrix printer. Design banners, letter heads, greeting cards, signs, and more. Utilities include:
transfer options to move system files, fonts, borders and clips to the ramdisk, (if you have a memory expander);
config clips and fonts to use with the Print Works. Fonts and clips can be three sizes; regular, two times, and four times the regular size.
Overlay borders and clips with text, even
overlay text with other text.
Use up to 77 different, regular size clips on a sign.
Mix different sizes and styles of fonts, all characters are used, even in the larger fonts.
Displays clips, fonts and page layout. Several custom clips, fonts and borders included.

Graphic SmartKEY driven, requires one drive, parallel interface and a dot matrix printer. To use ramdisk option, a memory expander is required.

WRITE SOFTWARE COMPANY

ADAM CONNECTION (D/DP) $24.95 (IBM Compatible Program) Convert ADAM files to IBM files:
Fully convert SmartBASIC files to IBM ASCII text.
Fully convert SmartBASIC programs, data to ASCII text files.
Convert SpeedyWRITE V1 or V2 text files to ASCII text files which can be read by most IBM word processors.
Transfer any binary file.
Rename, delete, and get status of any ADAM file from the IBM,
change status of any file; (protected, deleted, etc.).
Format any single or double-sided disk for use on the ADAM on the IBM, (in 1/4 of the time it takes an ADAM).
Copy single or double-sided ADAM disks on the IBM.

REQUIREMENTS: IBM PC or compatible with: MS-DOS or PC-DOS Versions 2.0 or higher, 360K 5 1/4" floppy disk drive, Coleco ADAM with 5 1/4" disk drive, (single or double-sided).

SpeedyWRITE 2.0 (D/DP) $39.95 The most advanced word processing program yet available for the ADAM, (except for programs using T-DOS). Written in fast machine language, SpeedyWRITE V2.0 offers all the functions contained in SmartWRITER, as well as features found in more expensive word processing programs for other computers.

Containing more than 100 features, the following is but a brief list:
40 column screen display;
10-12 double spaced pages allowed in one file;
change screen colors, insert text, move/copy, delete text, search/replace;
underlining, justifications, centering;
headers and footers;
create macros;
split screen, (view two parts of your document at the same time);
re-print page command;
skip to any page;
multiple margin settings within a document, multiple line spacing within a document;
subscripts, superscripts;
automatic indentation, auto page numbering;
multiple columns;
rename/delete files;
init the media;
screen review, (see just how your document will look when existing SmartWRITER documents are converted into SpeedyWRITE format); and so much more.

Plus:
On-line dot matrix support;
continuous printing;
Ram Disk support, (will use available ram as a Ramdisk).

Will also use a memory expander as a Ram Disk, (this will allow you to store files directly on the expander for almost instant access), file handling routines have been improved, wild cards can now be used for file access, up to 10 help screens are stored on the ram disk, insert control codes to change the type styles used in printing (dot matrix printers only), install up to four config files to be auto-loaded, and much more and a Pocket Database!

The ultimate in word processing on the ADAM, so much that is new, it would take pages to describe. If you are doing any writing, this is the only word processing program that you will ever need with your ADAM, (unless you are working with very long documents or need to move your word processing along faster, in both of which cases you will need to get a professional program and work in T-DOS).

SpeedyWRITE SPELL (D/DP) $24.95 (Memory Expander Required) Full dictionary with over 10,000 words and a full thesaurus with over 5,000 words. This spell checker runs very fast. It remains in memory along with SpeedyWRITE V2.0, (does not work

with SW V1.0), to create the ultimate in word processing power on the ADAM.

WIZARD'S LAIR SOFTWARE

CLIP-ART VOLUME I & II (D/DP) $12.95 This package contains 96 clip-art files for use with PowerPAINT and CLIPPER by Digital Express or THE PRINT WORKS and THE LABEL WORKS by Walters Software Co.; along with any other programs which can use clip-art. These are some of the finest clip-art pictures that you will find for the ADAM.

EASY AS A,B,C & 1,2,3 (D/DP) $11.95 This is a "two disk" or "one data pack" educational package. Uses PowerPAINT high-resolution screens and CLIPPER clip-art picture files to help teach children how to spell words and become familiar with the keyboard.

The second phase of "EASY AS" is a picture comparison program in which the child is presented with three pictures and must decide which out of the three does not belong with the other two. Features include percentage tallies and final letter grade.

PowerPRINTS VOLUME I (D/DP) $11.95 This package contains fifteen full cell PowerPAINT compatible picture files. Place these high quality, high-resolution pictures anywhere in your document or even better yet, use them for back drops for your own SmartBASIC V1.0 programs! These files can only be loaded by PowerPAINT or SimplePAINTER by Digital Express.

SCHOOL DAZE (D/DP) $16.95 This is the second in a continuing line of educational packages. School Daze offers three programs:

MATH DRILL, which allows for the drilling of addition, subtraction, multiplication and division problems from math tables 0 through 12.

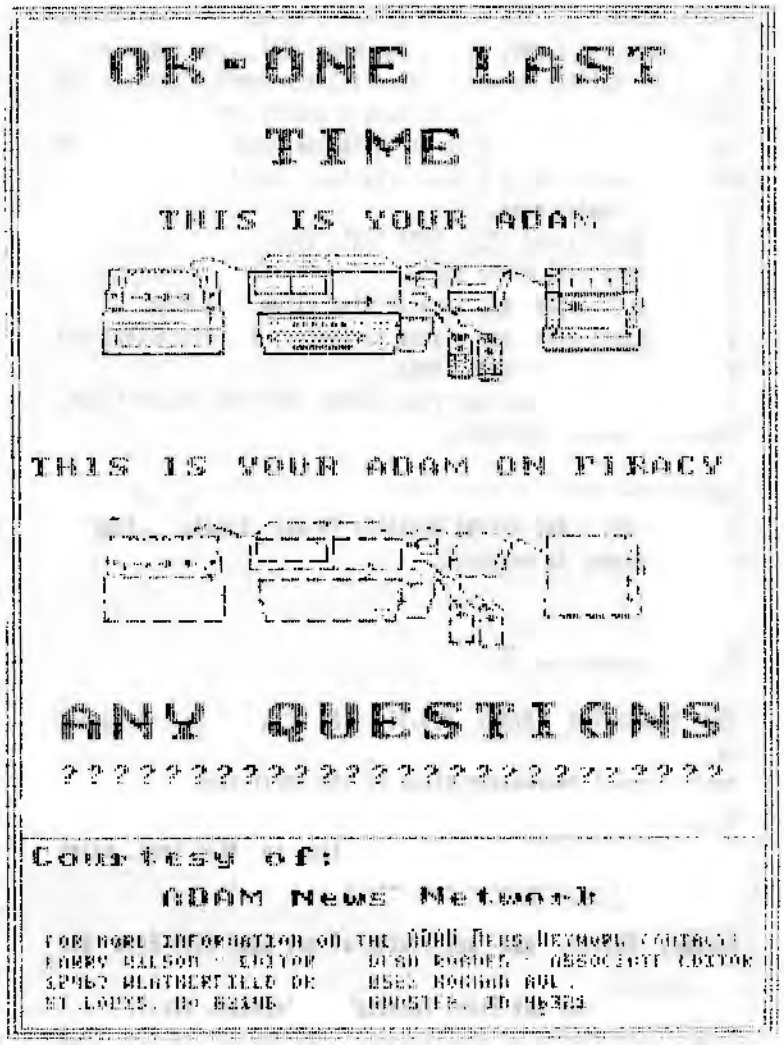
MATH CLIMBER, has the gamer climbing a castle wall while answering random mathematical equations. Answer the equation correctly and our hero will climb up a rung on the ladder, answer it wrong, and he/she slide down a rung.

ADAM SUPPORT, a compilation of names, addresses, phone numbers and descriptions of over 60 known ADAM support firms across the U.S. and Canada, which is presented in database format. Print these addresses out on the ADAM printer or a dot matrix printer.

School Daze uses PowerPAINT high-resolution screens and sprites to create a pleasant atmosphere for the child's work environment, along with SmartKEY menus for choosing options. This is one program your child should not be without!

SnapSHOTS VOLUME I & II (D/DP) $10.95 This package contains 70 picture files in both SignSHOP and NewsMAKER formats (both programs by STRATEGIC SOFTWARE INC.). Use these picture files in your own creations, which you can make with either of these two fine products; both of which support graphic printing on the ADAM printer.

Eric Danz



GAME SOFTWARE FOR THE EOS

by Eric Danz

A-WARE SOFTWARE

AMERICA AT WAR (DP) $9.95 This multiple quiz game format provides an educational understanding of six significant wars involving the USA.
Menu selections:
1: Revolutionary War,
2: Civil War,
3: World War I,
4: World War II,
5: Korean War,
6: Vietnam War.

A & S SOFTWARE

MYSTERY V1.2 & YACHT (D/DP) $14.95 In Mystery, you play a detective in this very challenging "CLUE" style game as you try to figure out a who the murderer is. In order to solve the murder, you have to figure out in which room the murder occurred, the weapon which was used, and also who done it! High-resolution graphics, sprites and new font styles are incorporated into this colorful and mind boggling game.

Yacht is a version of Yahtsee with multiple player options. The game rolls five die and you most add up the score in Yahtsee fashion to see who wins the hand. Scoring is identical to the Yahtsee board game. With every roll of the die, they are displayed on the screen in graphic form.

ADAMTAP SOFTWARE

ZORAN III (D/DP) $13.95 A game of man versus computer. You are an especially trained programmer working for the pentagon. Your job: Find and delete the ZORAN III virus that is running loose within the pentagon's central computer network. But for Zoran, you are just another game. Be careful because if you waste time, Zoran will use the programs that he has corrupted against mankind. So hurry, find him, don't let him find you. But make sure you delete him before it's too late! This is a very large game which uses text, graphics, music and the EVE SS-CC, (if you have it), so that Zoran can talk to you.

ALLIED CREATIVE ENGINEERS

STRATOZAP (D/DP) $16.95 Though many, many aions have passed since the final actinic blasts of the third Galactic War, the nuclear waste has finally begun to rarefy the atmosphere of your home planet, Sartaysia. While most Sartaysians are furtively working toward the completion of subterranean dwellings, a select few have volenteered to man the new experimental weapons, "StratoZAPPERS" to vaporize stellar debris as it plummets toward the Sartaysian surface. This new weapon will have to be used until auto-sensors can be perfected.

StratoZAP is the computer simulation utilized to train the brave elite who will protect those who will remain on the surface. It has tremendous graphics and sounds, with some of the fastest paced and frantic game play you will ever experience from any ADAM arcade game.

APE SOFTWARE

ELECTRONIC GAME PACK I (D/DP) $17.95 A collection of five outstanding computer mind games jammed with outstanding graphics, sound and game play. Games included are: Backgammon, Battleship, Mastermind, 3-D Tic Tac Toe and Miners. An unbelievable value for the money when you consider that five different games are included.

ELECTRONIC GAME PACK II (D/DP) $17.95 The second in a series of entertainment packs which are jammed with outstanding action games that feature terrific graphics, sound and game play. Included on this pack are: Car Wars, Crater Tag, Sky Ring and Snake Weeds.

AVIDAD, INC.

SACRIFICE OF THE SPIDER QUEEN (DP) $14.95 To our knowledge, this is the first and only full length text adventure game that reads like a novel for the ADAM. The program occupies 180 blocks of data, so you know it's jam packed with great adventuring action. Every command takes you to a new screen. There is so much more here, you'll be surprised.

CHRIS HICKMAN SOFTWARE

FORTUNE FINDER FROM THE FUTURE (DP) $14.95 A great text adventure game with graphics; it's different and very tough. This is one adventure that you will not want to miss.

COLECO ELECTRONICS

CABBAGE PATCH KIDS: PICTURE SHOW (CART) $18.95 From the scenery to the show, create your own "Cabbage Patch Kids" animated pictures. Set the stage with one of the special scenes provided, or build a fantasy scene all your own and fill it with props. Choose from 15 vibrant colors to brighten each and every scene.

Learning opportunities:
Role-playing,
Narrative sequencing,
Pre-reading skills and
Introduction to design and colors.

Ages 4-8.

SUPER ZAXION (DP) $9.95 More screens, more skill levels than the cartridge! More enemies and obstacles to conquer; drone planes, asteroid fortresses, weapons, barriers. Hall of Fame and much more.

DATA DOCTOR

STRATEGY STRAIN (D/DP) $16.95 Nine intellectually challenging computer classics, good graphics and sound. Includes: Towers of Hanoi, Klingdon Challenge, Pixxatar, and Lunar Module Simulation.

DIGITAL EXPRESS INC.

G.A.M.E. SET #1 (D/DP) $12.95 Two volumes, (2 disks or 2 data packs), with a total of 14 entertaining songs and colorful hi-res pictures. Good entertainment. Great for showing off your ADAM system. Very USEFUL for recording as video tape headers.

G.A.M.E. SET #2 (D/DP) $12.95 14 more great music and graphic combinations for bringing out the best in your ADAM. Sound and graphics quality you have to see and hear to believe.

BEYOND TREK (D/DP) $15.95 (Memory Expander Required) It's here! Pull the reset, a title screen instantly appears and the theme song starts playing. A few seconds later, the Enterprise appears as more of the program loads into memory. You'll hear a couple of more tunes and then Kirk's soliloquy is displayed, ("spoken" if you have the Eve SS/CC). Then you take command!

Your goal is to protect the four starbases and annihilate those belligerent Klingons. You have a full arsenal of weapons and you can get more at a starbase that's in good condition. You have a variety of maneuver options. Plus, three charts and a graph are at your disposal.

The entire game is played with the front game controller keypad. There are four skill levels and a hall of fame for high scores, (for the session or permanent record). This program is an adventure/graphics game that is based on the Star Trek game that has been available on other computer systems for a few years. If you like adventure games, then this is a must have for your game library.

CHESS CHAMP (D/DP) $15.95 (Memory Expander Required) The first graphic chess game for the ADAM computer. Use standard board setup or you can pre-position the pieces to your preference. Seven skill levels. Choose black or white. Change sides if you prefer. Move your pieces with a graphic hand. Store and load inchoate games.

FAST ED'S SOFTWARE

DEMONS & DRAGONS I (D/DP) $19.95 Text and graphics in an exciting adventure game. You go back in time to "the good ole' days", make your own characters, buy your equipment at the post, run a maze, magic spells; and meet monsters and a host of some of the most unique situations and beasts you will ever encounter in an adventure game.

DEMONS & DRAGONS II (D/DP) $19.95 The sequel to the evers, a select few have volunteered to man experimental StratoZAPPERS until auto-sensors can be perfected. This new weapon will vaporize stellar debris as it plummets toward the Sartaysian surface. StratoZAP is the computer simulation utilized to train the brave elite who will protect those who will remain on the surface. Tremendous graphics and sounds with some of the fastest paced and frantic game play you will ever experience from an ADAM arcade game.

HAL WEBER SOFTWARE

THE BILLY SAGA VOL. I (D/DP) $15.95 A compendium of Billy Storygames where you engage in Billy's battles to rescue the planet from the mistakes of mankind and attacks of his arch-enemy, Dirty Dan Diamond. Includes GRAND TREK, a hazardous journey via joystick, SPACE SHIP LAUNCH, THE DOGFIGHT and THE CANYON RESCUE.

THE BILLY SAGA VOL. II (D/DP) $15.95 Later battles with Dirty Dan crew. The launch mission leads to TUT'S GOLD, a perilous search in Tut's pyramid. Other adventures included are: THE OZONE HOLE, THE TERRORISTS and THE BATTLE AT REPINOC II.

THE USA RANGER (D/DP) $15.95 An exciting way to learn the USA. Routine patrol of America is often interrupted by natural catatrophies, as Brat Simpleton and the Flying

Dunceman strive to wreck our ranger while he proceeds on his rescue missions. To succeed is to qualify for entry into the prestigious supergame tourney. A scientifically designed set of three games and a tutorial, guaranteed to better your graphics memory.

Includes STATES RACE and WITS, and highly lauded MINDPOWER.

IMAGE MICROCORP

BLACK GOLD (D/DP) $15.95 A board style game for 1 to 4 players. The computer simulates an oil deposit hidden beneath the surface of the earth. Choose a location on a map, geological survey can be printed. Probability, drilling costs, taxes, etc.

DIABLO (D/DP) $15.95 The game consists of tracks, panels, and a ball. Excellent graphics-and-sound support a maze-like and arcade-style game in one. This game demands substantial strategy, planning, and decisive control. Guaranteed to chalenge and addict, Diablo offers a unique opportunity to combine strategic planning, quick thinking and computer dexterity underpressure. It's a challenge you just can't afford to miss.

LES SOFTWARE

SmartGAMES PACK (D/DP) $9.95 Three arcade games roled into one package:
1. SPACE CHASE - 2 player space game, this is a fast action arcade style game,
2. TREASURE SEARCH - Enter the gigantic tomb of many rooms, ghosts, etc. Find the treasure if you dare!
3. MAZE ESCAPE - Over 1,000 mazes to find your way through against a timer.

M & M SOFTWARE

M&M JEOPARDY QUESTION PACK (D/DP) $14.95 The best question pack for use with Jeopardy! ("Jeopardy" is a public domain program by Coleco). This question pack is fun as well as challenging, and for those of us whose spelling is not too great, M&M SOFTWARE has made the giving-of-answers easier than ever. For all of you ADAM lovers out there, you might want to do your homework, because with categories like ADAM BASIC and ADAM GAMES, this makes this question pack just for us.

MURDOCK GAMES

PRO FOOTBALL (D/DP) $18.95 Pro Football uses stats from actual pro games to create an actual simulation of a pro game. You call the plays from the sideline as ADAM executes the plays that you call. Program contains the following features: One or two players, demo mode, thirty- six plays, punts, field goals, kickoffs, sprites, sound, and foll field view.

MR T'S SOFTWARE

KID'S TRIVIA PACK I (D/DP) $12.95 Contains 1080 questions and answers in 6 categories. The program randomly selects one of the six categories for you and displays the question. Very nice graphics, colors and sound are used to make this a great game for those who enjoy trivia. It's GREAT! Geared towards the junior high school through high school student. Up to four players may compete against one another.

MR. T SEARCH (D/DP) $12.95 Enables one to produce magazine quality word search puzzles, solve them on-screen, print them and save them on data pack or disk. The program comes with 27 games and word lists ready to build, play or print on your ADAM or dot matrix printer. Mr. T Search displays an automatic timer, scans your drives for a medium, utilizes a 40 column screen and lets you SEE your puzzle being built.

Hours of enjoyment for student or scholar, child or adult. One of the most sophisticated programs ever developed for the ADAM.

MR. T SEARCH: GAMEPAK (D/DP) $9.95 Additional pre-made word search puzzles for use with Mr. T Search. Contains games from 3 letter words to scientific and medical terms. A real vocabulary builder.

TRIVIA PACK (D/DP) $12.95 Contains 1200 questions and answers in 6 categories: Music and Stage, TV and Screen, Times and Events, People and Places, Art - Lit and Science, Sports and Games. The program randomly selects one of the six categories for you and displays the question. Very nice graphics, colors and sound are used to make this a great game for those who enjoy trivia. Trivia lovers will love this one, it's GREAT. Up to four players may compete against one another.

MR. T'S PUBLIC DOMAIN COLLECTION

Mr. T. has taken some of the best of the Public Domain ADAM programs, and some of his own works, and assembled this library of ADAM software. The programs are enhanced with colorful screens, pleasant sounds, are all are fast loading. The medium is self-booting, (just insert it, and pull the computer reset); and menu driven for speed and convenience.

MIAD GOLD: GAMES (D/DP) $9.95 Contains ALL OF THE FOLLOWING:

POISONIVY - While the poison ivy grows, you must make your way across the screen without getting trapped.
MOONBASE - Pilot your ship across the mountain tops to land on the pads without crashing. HI-Q - This challenging, graphic game will test your strategy and patience.
HORSERACE - Check the odds, pick your horse, place your bet and they're off.
HANGMAN -The classic game for children or adults; pick short, medium, or long words.
KENO - The famous Las Vegas game.
MAZE - A terrific maze game with different difficulty levels and sizes.
SPEEDMAZE - You can't stop, hit any walls or back up to get to your goal.
OTHELLO - The classic game extremely well done in graphics for 1 or 2 players.
PATIENCE - The classic game of Solitaire will entertain for hours.
GRAVITAR - You must land your ship in the valleys without crashing.
GOMOKU - A challenging game against the computer. And ADAM is good so you'll have to use your best strategies.
CANNONS - You must fire your cannon at the right angle and hit your opponent.
BREAKOUT - The famous arcade game with good graphics and sounds.
SCRAMBLE - Unscramble your opponent's word for points.
MOSQUITOES - Trap all of the mosquitoes in the bug lamps before they trap you!
TOWERS - Move the disk to a different peg in the least number of moves.

MIAD GOLD: TEXT ADVENTURES (D/DP) $9.95 Contains ALL OF THE FOLLOWING:
TRUCKER - You have to drive your cargo cross country avoiding the police, bad weather and other obstacles.
LIGHTHOUSE - Terrific adventure with graphics (it's not easy), but loads of fun.
GOLDEN -Find Golden Flute & avoid the evils of the magical woodlands.
JEWELHUNT - Another great adventure challenges you to find the hidden jewels.
WILDWEST - For those who like western who-done-its.
ADVENTURE- One of the best challenges. You'll have to draw a map to get through this one.

M.I.A.D. SOFTWARE / SERVICES

INFOCOM CONVERSION to ADAM CP/M FORMAT (D/DP) $4.00 Send in your Infocom titles to be converted to an ADAM CP/M format. Inform us whether to overwrite the original or to place the ADAM CP/M version on a separate Disk or DDP, and send the required blank media.

The listed INFOCOM titles can be purchased at most computer stores in your area. We can convert: Zork I, II & III, Planetfall, Deadline, Starcross, HitchHiker's Guide to the Galaxy, Leather Goddess' of Phobos, Stationfall, Plundered Hearts, Ballyhoo and Seastalker.

TRIVIA WORD SEARCH (D/DP) $7.95 Additional word search puzzles for use with "Mr. T Search" by Mr. T Software. Why spend the time making your own puzzles when someone else all ready has done the work?

PHOENIX 2000

PITY (D/DP) $18.95 A colorful, graphic board pursuit game similar to the SORRY and TROUBLE boardgames. One to four players, ADAM can play too! Great fun for kids and the young-at-heart, good entertainment for the whole family. Uses a point-and-click user interface to make it a snap to learn how to play, even for youngersters. Sharp graphic displays and strong sound support make this a captivating game.

SUPER PARROT (D/DP) $12.95 The commercial version of the public domain program named Parrot. This colorful, SIMON-like memory exercise game uses a simple POINT-AND-CLICK interface. The computer flashes a musical note and a large color arrow on the game board. You, in turn, play the note back by tapping the corresponding arrow key. With each correct reply, one note is added to the sequence.

Two play options: ADD-A-NOTE, (continues the same sequence adding one more note); and NEW-NOTES, (one more note each time, but a different sequence).

D-MATCH-EM (D/DP) $12.95 The commercial version of the public domain title EZ-MATCH. This one has several more options including the simple POINT-AND-CLICK user interface. Compete with a friend or play against ADAM. Players alternate turns flipping two tiles on an on-screen play board consisting of forty tiles. If the two objects exposed by lifting the tiles match, the matching objects and the two tiles are removed; also, the player wins a point and gets to select again. The player with the most points when all the tiles are removed is the winner. There are three sets of objects from which to choose; (Alphabet, Lines & Bars and Ordinary objects); and there is a board preview options. Is your CONCENTRATION good enough to win?

READY SOFTWARE

ADDICTUS (D/DP) $17.95 Addictus is a game of skill requiring quick thinking, and is guaranteed to be different from anything else you've ever played on ADAM!! It sounds simple enough: Various moving shapes most be rotated and positioned

to form solid rows. The game is easy to play and can be learned quickly. You'll soon find yourself mesmerized by this wonderfully rewarding game!

With colorful, animated graphics and sound, Addictus is always new, always challenging, and always fun! This "puzzle in motion" gets it's addictive powers from the fact that it is extremely easy to learn but very difficult to master. Addictus also features pause, ten advancing levels, and recording of the top twenty scores. This habit-forming game is a must have package for all ADAM owners: even for those who thought they didn't like games! Addictus has received high praise from the entire ADAM community.

DRAGON: THE CHINESE CHALLENGE (D/DP) $17.95 "DRAGON: The Chinese Challenge" is a compelling strategy game for the ADAM; inspired by the centuries-old Chinese game called Mah-Jongg, which requires you to clear a board of 144 layered tiles, by matching pairs. DRAGON is done completely in detailed, high-resolution graphics and uses sprites and sound. Also uses innovative ADAM features like a pop-up SmartKEY menu, Dialog Boxes, and complete keyboard or joystick control. This is sure to be a game that everyone will enjoy! You'll find every game completely engrossing and randomized!

LAB MOUSE (D/DP) $12.95 In this unusual game, you take on the role of a laboratory mouse stuck in a maze! The high-resolution 3-D maze is shown in first person perspective. Select from five skill levels. Every maze is different and the only way out is to find the cheese!

MAGE QUEST (D/DP) $13.95 This is a super graphic adventure by Brian Miquel. Using various spells, you must retrieve the nine Wards of Power that were stolen by the evil Enteon. Features include all high-resolution graphics, sound, nine challenging levels, pause, and much more! But the fun doesn't end when you complete the nine levels: Mage Quest has the ability to utilize more levels in the form of Solo Adventures.

Mage Quest is supported with two Solo Adventure Packs, (see the Public Domain section of this catalog); plus Mage Quest comes with three Solo Adventures as a bonus!

Using Mage Quest Construction Set, creative players can even create their own Solo Adventures!

MAGE QUEST CONSTRUCTION SET (D/DP) $13.95 This sophisticated package by Brian Miquel allows Mage Quest users to create their own Solo Using a Macintosh-like arrow pointer that is controlled with the joystick, you can easily create monsters with the built in sprite editor, (or choose from a library of ready-made beasts), create Wards, design the dungeon layouts, and more! You can even edit existing Solo Adventures. Your only limit is your imagination! The Solo Adventures that you create can then be played with Mage Quest!

PHRASE CRAZE (D/DP) $17.95 An exciting "Wheel of Fortune" type of game. Up to three players compete to figure out the phrase in each of the three rounds. All High-resolution, colorful, animated graphics and sound make this game great fun! There's even a Hall of Fame! Comes ready to play with hundreds of phrases. Has an option to utilize Phraze Packs which contain even more puzzles!

Phrase Paks are available separately, plus you can make your own with the Phrase Pak Construction Set. Find out why Phrase Craze is many ADAM owners' favorite game!

PHRASE PAK I (D/DP) $9.95 This package includes more phrases for use with the very popular Phrase Craze game, (over 150 games worth)!

PHRASE PAK II (D/DP) $9.95 This is a special "Show Biz" Phrase Pak. Includes over 150 games worth of puzzles for use with Phrase Craze that are related to the entertainment industry: celebrity names, movie titles, television shows, and more!

PHRASE PAK CONSTRUCTION SET (D/DP) $9.95 This program allows you to create your own Phrase Paks for use with Phrase Craze. The program is very easy to use and the instruction manual tells all you need to know to create your own Phrase Paks.

READY ENTERTAINMENT PACK (D/DP) $13.95 Each game uses arcade sound effects and colorful graphics. These one and two player games will provide you and your family with hours of fun. The following games are on this pack:

CONNECT 4 - Fun and challenging strategy game that can be played against another player or against ADAM. Stack blocks on poles and try and connect four in a row vertically, horizontally, or diagonally. A very addictive game with colorful graphics and great sound.

BLOCKADE - Breakout type game that requires fast reflexes, 1 or 2 player options are available with individual skill levels. Has a handy pause feature.

SLIDE PUZZLE - Slide the panels of a puzzle until they're in the correct order. Graphics are in hi-resolution, and sprites are used for smooth animation. Movement can be done with the joystick or the arrow keys.

READY SOFTWARE LIBRARY (D/DP) $17.95 Includes an assortment of SmartBASIC programs:

MICHIGARA JONES - a fun text adventure game,
VIDEOPAINT - paint and save low-resolution pictures,
TEXTEDITOR - print text in HGR screens,
PICTURE SUBROUTINE MAKER, and more.
VIDEOPAINT - paint and save low-resolution pictures,
TEXTEDITOR - print text in HGR screens,

PICTURE SUBROUTINE MAKER, and more.

STAGE FRIGHT (D/DP) $13.95 This mammoth text adventure took humorous programmer Mike McCauley over two years to complete! You're an actor or actress trapped in an abandoned theater. Features include three levels of play, music, text animation, function keys for ease of use, saved games, and more! A real treat for the text adventure fans!

Stage Fright Directory book available through Reedy Software.

RH SOFTWARE

ADAMWARS II (D/DP) $13.95 This is a board game designed for one player. The object of the game is to accumulate points and cash, and by doing so in a proper manner, to further the cause of ADAM. ADAMWARS II places the gamer into the role of operating an ADAM company. The gamer will have all types of decisions which will affect the prosperity of the ADAM computer. Will you buy software/hardware, buy the rights to distribute products, sell hardware/software, borrow money, elect/be elected to certain offices, (newsletter editor, librarian, etc.), write software, demo products, trade, (legally or illegally), products, etc. As you grow and prosper, so does ADAM. It's up to you to save our little orphaned system! Do you have what it takes?

ROSINSKI GAMES

LAS VEGAS CRAPS (D/DP) $16.95 Experience all of the thrills that the casinos in Las Vegas, Reno and Atlantic City offer, without the worry of having to mortgage your house after a bad night at the tables. A terrific rendition of the craps table is displayed on the screen and you even see the die role across the screen. Betting options include: point, pass line, don't pass, field, come, don't come, take odds, buy bets, lay, place a number, prop, any 7, any craps, hard 4-6-8-10, horn, 2-3-12 craps, and 11.

Creates a custom starting account for players, and will track this account from session to session. Created by a manager of a hotel casino in Las Vegas for the ADAM. Uses SmartKEY displays for most user input.

STEVE PITHAN SOFTWARE

ADAM BOMB (D/DP) $19.95 (Memory Expander Required) You are captured by aliens and taken to their home planet, ADAM, where you must complete all 30 screens to return to Earth. On your journey, you must collect all of the diamonds on each screen, avoiding traps! You must collect keys to open locked doors as well as collect bombs to destroy brick walls for when the going gets tough. Many of the objects, (including walls and boulders), are hidden under the grass until you run into them.

Tremendous graphics, sound effects and game play; make this one of the best games ever developed for play on the ADAM. And if that isn't enough that you survive all 30 screens, you can design your own sets of 1 to 30 screens with "BOMB DESIGNER" which is also included. Now includes the ability to start at any of the 30 levels.

BRAINSTORM (D/DP) $16.95 Seven different shaped blocks fall down the pit, one after the other. The object of the game is to keep the blocks from piling up to the top while collecting letters to help you solve the phrase at the top of the screen. This is done by moving the blocks left or right with the hand controller and rotating them clockwise with the left fire button as they fall.

If you can completely fill in one horizontal line, that line disappears and the rest of the puzzle moves down, if you complete a line with a letter in it that is used in the phrase, that letter will appear in the phrase. You can also make the shape fall faster and pause the game.

There are 25 stages, 4 skill levels and three categories, (Normal Phrases, TV and Movie or ADAM related phrases), to choose from. Each category has hundreds of phrases and every time you play, ADAM will keep track of the phrases you have used so that none of them will be repeated until you have used them all.

Two separate games are included: GAME A is the ADAM version of TETRIS rolled into a Wheel of Fortune game and GAME B is the traditional rendition of TETRIS without phrases. AWESOME!!

DINOSAUR DIG (D/DP) $16.95 (Memory Expander Required). It's the exciting new game show where you compete against Adam or another player. The object of the game is to find dinosaur bones and build a Tyrannosaurus Rex! Win money! Buy land! The dinosaur will be pieced together as each bone is found.

Use strategy on the land screen to win one the eighty-one squares of land available before the computer does. And if you stop the spinner on DIG on the game board, you get to actually dig in any of the squares of land you own.

The game has colorful hi-resolution graphic screens, and Coleco-like SmartKEY Menus. ADAM plays a mean game!

GHOST ZAPPER (D/DP) $11.95 (Memory Expander Required) This is a fast paced shooting game where you are in a haunted house and you must clear the house of all of the ghost's and other assorted demons which peek in windows and around the corners.

You start each screen with five Ghost Zappers, each ghost or demon that gets away will cause the loss of one Zapper.

You must clear several rooms in the house and the graveyard in order to reach the bonus screen where you must shoot the four ghosts on the screen. They are concealing the letters of the word "ADAM" behind them, IN ORDER! Includes a Hall of Fame for storing the best scores.

MIND OVER ADAM (D/DP) $11.95 Based on the popular game "MASTER MIND", with high resolution graphics, animation and sound! You play against Adam and have 8 chances to figure out the four color pattern Adam has hidden. You must have the correct color and position of the color in order to win.

You are given points for each correct guess and bonus points for each level completed. You must complete all five levels to beat Adam. The top eight scores are entered into the Hall of Fame using a tremendous rendition of a Ouija board.

RoboTHIEF (D/DP) $19.95 A visiting alien from the planet ADAM needs your help! He ran into another visiting alien from the planet NES, and was robbed as well as put under a spell! You are in control of three robots aboard the enemy's ship, use them to steal everything back so that the ADAMite can return to his planet.

It won't be easy, it will take a lot of skill as you simultaneously manuever three radio-controlled robots through 30 screens while avoiding walls, security alarms, disintegrating slime blocks, collecting $1, $5 and $10 bills, drop bombs to expose crystals hidden in the floor, avoid or using RoboFreezers, use strategy with the arrow-blocks, and all within a certain time limit.

There are also many warp doors that you can use to skip ahead or back in the game, but you must figure out how to use them first. Also includes a Pause feature and Password feature allows one to start on any level which has previously been completed.

Great graphics and sound effects compliment this tremendous strategy challenge throughout all 30 screens.

SUPERIOR SOFTWARE

APL FOOTBALL (D/DP) $14.95 Two player statistically oriented football game. Choose from more than 15 options on offense; 5 on defense.

Graphic presentation of field position.
Individual/team stats shown at halftime and game end. Run leagues; computer automatically keeps and updates your teams's progress. Keep records, (most sacks, most passing yards, etc).

TELEGAMES U.S.A.

ALCAZAR (D/DP) $18.95 ALCAZAR, a castle built in Spain, is said to contain the riches of a dozen rulers. Folklore also whispers of demons and un-imaginable peril. To reach the entrance, you will need to venture through a countryside of ancient castles. Each one harbors within it's confines: fire-breathing griffins, saber-swinging goards, bottomless shafts, and more. Through over 20 castles with hundreds of rooms, you will be driven to call upon every ounce of strength and intellect you possess to decipher both visual and unique audio clues. Can you survive and reach the throne?

AQUATTACK (D/DP) $17.95 Your job is to guide the Buran agent Captain Blitztek through enemy territory to prevent the A from taking control of world forces. Fast paced action arcade game with all forms of enemies from land based tanks to air gliders and speed boats in this one player game.

BLOCKADE RUNNER (D/DP) $15.95 You have a commander's eye view of the galaxy in realistic 3-D as you guide your fleet of 4 merchant space freighters to Earth with vital supplies. No aliens have sighted you and forced you into a dangerous asteroid belt. The skilled commander will avoid the asteroids, destroy robot mines and alien ships, contend with fuel shortage, and prevent the deflector shields from over-heating. One player game.

BOULDER DASH (D/DP) $18.95 An addictive mixture of challenge, strategy, reflex, and charm. Collect the required number of jewels and the mysterious escape tunnel is awarded. Can you and Rockford master the enchanted walls, transform butterflies into jewels, and escape the growing amoeba?

NOTE: This game won Family Computing's "arcade game of the year award" in 1984.

DECATHLON (D/DP) $18.95 Compete in ten different Olympic events: 100-Meter dash, Long Jump, Shot Put, High Jump, 400-Meter Race, 110-Meter Race, Discus, Pole Vaolt, Javelin and 1500-Meter Race. This is a true test of your joystick handling skills for one or two players.

PATHON (D/DP) $18.95 Titans have imprisoned Neptina, the daughter of Neptune! They have shattered his magical trident, scattered it's pieces in the air and under the sea. Without his trident, Neptune is powerless. You, as Proteus, must find all of the pieces of the trident, changing from a dolphin in the water, to a seagull in the air. A tremendous adventure game.

H.E.R.O. (D/DP) $16.95 Reach miners trapped miles under the

surface of the earth! Use the Prop-pack to maneuver through a maze of mineshafts. Blast vile vermin with the Microlaser Beam. Dynamite Walls. Negotiate across the lethal lava flow. Rescue all of the miners possible before running out of "lives" or power. One player game with 20 different levels.

KEYSTONE KAPERS (D/DP) $17.95 Capture the department store burglars in this rollicking cops and robbers game. A one-player game in which you compete against the computer.

MOONSWEEPER (D/DP) $15.95 Reach and rescue miners stranded on moons in the four galaxies of Quadrant Jupiter. Warning! Proceed with extreme caution. Deadly meteor showers, comets, aliens vessels and space debris in the Quadrant are at lethal levels. Destroy them or take evasive action, then land on all the moons in as many of the galaxies as you can reach. Avoid colliding with lunar landmarks.

Survive at all costs, or the miners won't make it!

NOVABLAST (D/DP) $18.95 Red Alert! The four capsuled cities of Water Planet Hydron are under fierce enemy attack! You must pilot Nova 1, the last of the Novon Fleet, over turbulent seas. Blast orion Fighters, Gravitines and six other types or airborne aliens before they obliterate the cities or damage your ship! One player game with 3 skill levels.

PITFALL II (D/DP) $17.95 Help Pitfall Harry find his niece Rhonda, the cowardly cat Quickclaw, and the great Raj diamond. On the way, grab all of the gold bars you can grab, (and be on the lookout for a pesky stone-aged rat). There is no time limit in the caverns.

RIVER RAID (D/DP) $17.95 Your mission is... to score as many points as possible by destroying enemy battleships, helicopters, fuel depots, jets, land tanks, hot air balloons, and bridges before your jet crashes into the narrow channels through which you must fly, or until it runs out of fuel.

ROCK 'N BOLT (D/DP) $18.95 Before you awaits the construction world's most complicated confused mess of mind-boggling blueprints, bolts, beams & girders. It's a dazzling, dizzying, incredibly exciting, high-rise challenge, all 100 floors of it. You'll spin, leap, and dance your way from beam to beam, puzzle to puzzle. Earn bonus wages and hire extra workers.

SQUISH'EM SAM (D/DP) $18.95 Journey to the top of a 48 story building to collect a suitcase full of money. Avoid the creepy creatures, (or stomp them with your feet); who are determined to knock you off the building. Dodge falling objects which make the climb even more difficult and dangerous. But Sam is not lost for words, he TALKS to you from time to time!

THE HEIST (CART) $18.95 Join forces with the world's greatest super-agent, Graham Crackers, and experience the chilling suspense and unknown terrors of international espionage. You must infiltrate a museum that's really a "front" for a terrorist organization. Then you must cleverly "Heist" all of the artwork in search of the secret microdot. Find it or the world is doomed! Find it in one of the 90 different booby-trapped rooms!

TOURNAMENT TENNIS (D/DP) $18.95 Plays just like the real thing. Great fun for tennis fans. Two player option or play against the computer opponent.

WING WAR (D/DP) $18.95 You play a fire-breathing dragon battling your enemies to collect your stolen eggs and return them to your underground nest before they hatch. Watch out for exploding volcanoes and numerous other obstacles in this enormous, and graphically appealing, adventure quest.

WALTERS SOFTWARE CO.

FAMILY FEUD QUESTION PACK (D/DP) $14.95 Contains new questions for 26 more FAMILY FEUD games.

REQUIRES: Family Feud game from Coleco.

FAMILY FEUD WRITER (D/DP) $19.95 This program allows you to create your own FAMILY FEUD question packs. Just type in your own questions and answers. Easy and fun.

JEOPARDY QUESTION PACK (D/DP) $14.95 Package , a perilous search in Tut's pyramid. Other adventures included are: THE OZONE HOLE, THE TERRORISTS and THE BATTLE AT REPINOC II.

JEOPARDY QUESTION PACK (D/DP) $14.95 Package contains questions for 26 great JEOPARDY games. Public domain JEOPARDY game is REQUIRED.

JEOPARDY WRITER (D/DP) $19.95 Create your own JEOPARDY question packs. Just type in your own questions and answers.

THE USA RANGER (D/DP) $15.95 An exciting way to learn the U.S.A. Routine patrol of America is oft interrupted by natural catatrophies as Brat Simpleton and the Flying Dunceman strive to wreck our ranger while he proceeds on his rescue missions to qualify for entry into the prestigious supergame tourney. A scientifically designed set of three games and a tutorial, guaranteed to better your graphics memory. Includes STATES RACE & WITS, highly lauded MINDPOWER.

THE VASE OF TURR (D/DP) $29.95 Search for the sacred Vase of Turr in an under-ground maze. As an adventurer you must unlock the mystery of the vase, but act fast or someone might solve the mystery before you do. Make sure your flashlight is

in good shape because you never know what you might find in the caves.

100% machine coded program with "on screen" graphics, background music, sound effects and Coleco graphic SmartKEY If not the most advanced and toughest adventure game ever developed for play on the ADAM. Also, allows for the saving of games in progress for later play.

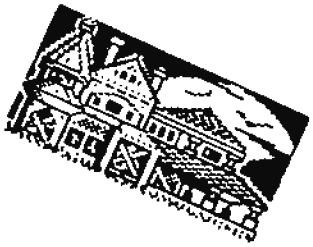
WIZARD'S LAIR SOFTWARE

WIZARD'S PINBALL ARCADE (D/DP) $14.95 This package contains 17 GREAT PINBALL GAMES! Created by an artist using PINBALL CONSTRUCTION SET, these games took hundreds of hours to complete. The following GREAT games are included on this package:

AVALANCHE,
ACES,
ROCK'N ROLL,
TILT,
WHAT'S UP,
SKYCASTLE,
PARALYZER,
LOST VEGAS,
REBOUND,
THE EDGE,
BARON,
SLICE,
GRANDSLAM,
ENDURANCE,
BUMPERCITY,
NOVA and
TRIAD.

These are some of the finest pinball games that have yet to be created for the ADAM. This package comes on two disks or one data pack and is auto-loading. The Pinball Construction Set (public domain program by Coleco) is not required, but can be used to modify the pinball games.

Eric Danz



AN OUTLINE OF SMARTBASIC Ver 2

by Guy-R LaForest

The advent of SmartBASICv2.0 brought along the correction of many v1.0 bugs, some new commands, and access to the 64K memory expander for larger programs with a total capacity of roughly 90K. In the EXTMEM mode, programs will RUN slightly slower but at least you can RUN larger programs. I mostly use mine in STDMEM. In short, v2.0 is far superior to v1.0 whether you use it in STDMEM or EXTMEM. As a bonus, a revised EOS is loaded which uses the same jump tables as the one in ROM.

The only disadvantage to using v2.0 is that little information is available about its inner workings so as to allow the user to modify it, for example, with color POKEs. My goal is to unlock some if its mysteries in order to promote its use.

Based on Winkley's "The Hacker's Guide to Adam Volume Two", the following are the addresses of routines, pointers, tables, etc., for SmartBASIC v2.0 in STDMEM. In EXTMEM, the bytes 0 to 16766 are rewritten modifying some routines and changing the addresses of others. The new addresses for EXTMEM are written underneath in /italics/.

Although I have not yet discovered all routine addresses, quite a few are listed. So enjoy and if you discover any more addresses which are not included or have questions which I might be able to answer, contact me. Guy-R. La Forest, P.O. Box 548, St-Jacques, NB, E0L 1K0, TEL:(506) 739-8953.

VERSION 2.0	DESCRIPTION	VERSION 1.0
102- 175	Interrupt routine	102- 171
256- 258	Start vector	256- 258
256- 258		
259- 261	Version I.D.	259- 261
262- 271	Numbers	262- 271
272- 813	Primary word table	272- 817
272- 813		
814- 933	Secondary word table	818- 937
814- 933		
934- 1051	Parse vector table	938- 1055
934- 1051		
1052- 1120	Copywrite	1056- 1144
1052- 1120		
1121- 1127	],:,CR	1145- 1151
1128- 1439	Error message table	1152- 1463
1440- 1459	Offset table for error messages	1464- 1483
1476- 1494	Load HL with number from	1500- 1518
1476-?/	crunch code	
1495- 1528	LD BC with number from crunch code	1519- 1552
1535- 1587	Central loop	16035-16088
1535-?		
1588- 1589	Pointer to start of line number table (HIMEM)	16089-16090
1590- 1591	Number of line numbers	16091-16092
1592- 1593	Length f line number table	16093-16094
1594- 1595	Pointer to start of variable table (LOMEM)	16095-16096
1596- 1597	Pointer to start of variable command name table	16097-16098
1598- 1599	Pointer to start of string space	16099-16100
1600- 1601	Pointer to start of crunch code table	16101-16102
1602- 1603	Pointer to end of crunch code buffer	16103-16104

1604- 1605	Pointer to the string of new variables	16105-16106
1606- 1607	Number of variables	16107-16108
1608- 1609	Pointer to start of variable value table	16109-16110
1610- 1611	Pointer to end of string space	16111-16112
1612- 1613	Temporary pointer to end of string space	16113-16114
1614- 1615	Pointer to start of string space	16115-16116
1616- 1617	Pointer to current DATA line number	16117-16118
1618- 1619	Pointer to current DATA crunch code	16119-16120
1620	Number of remaining bytes in DATA crunch code	16121
1621- 1622	Storage of DE for CONT	16122-16123
1623- 1624	Storage of HL' for CONT	16124-16125
1625- 1626	Line number for ONERR	16126-16127
1627	Command error number	16128
1628	Current SPEED	16129
1629- 1630	Vector to USR routine	16130-16131
1631- 1632	Vector to & (ampersand) routine	16132-16133
1633	ASCII for break (^c)	16134
1634	ASCII for pause (^s)	16135
1635	Indicator for pause	16136
1636- 1646	Temporary storage area	16137-16147
1647	ASCII code for indenting line numbers	16148
1648- 1649	Poister to POKE limit	16149-16150
1650	Sign for the result of operations	16151
1651- 1656	Temporary FPA data and pointers	16152-16157
1657- 1659	FPA1 data used in division	16158-16160
1660	FPA1 status byte	16161
1661- 1665	FPA1 mantissa and exponent	16162-16166
1666- 1668	FPA2 data used in division	16167-16169
1669	FPA2 status byte	16170
1670- 1674	FPA2 mantissa and exponent	16171-16175
1675	Maximum width of printer line	16176
1676	Position of head on printer	16177
1677- 1681	Temporary FPA for Sin, Cos, etc.	16178-16182
1682- 1688	Temporary FPA for calculations	16183-16189
1689- 1692	Random seed number	16190-16193
1693	Sign of floating point numbers	16194
1694- 1695	IN vector used by READ	16195-16196
1696- 1697	Vector to receive data from device (IN)	16197-16198
1698- 1699	Storage of PR vector for writing to tape	16199-16200
1700- 1701	Vector to transmit data to device (PR)	16201-16201
1702- 1703	Vector to printing on screen	16203-16204
1704- 1705	Lenght of crunch code buffer	16206-16206
1706- 1707	Line number to GOTO, GOSUB, etc.	16207-16208
1708	Temporaty ASCII code for line indenting	16209
1709- 1711	Null string	16210-16212

1712- 1727	PR vector table	16213-16228
1712- 1727		
1728- 1743	IN vector table	16229-16244
1728- 1743		
1744	Maximum lenght of input buffer	16245
1745	Lenght of input buffer	16246
1746- 2000	Input buffer	16247-16501
2001	Length of crunch code buffer	16502
2002- 2259	Crunch code buffer	16503-16762
2260-?	Add C to DE	14549-14554
2272-?	Save registers and word scan	11851-11863
2278-?	Check type of character	13659-13765
2323-?	Read buffer	11774-11785
3029-?	ABS	2276- 2284
3038-?	SGN	2285- 2325
3095-?	Load FPA1 to HL in interger format	2354- 2406
4418-?	LOG	3604- 3677
4492-?	SQR	3678- 3695
4630-?	EXP	3816- 3911
4726-?	TAN	3912-?
4760-?	COS	3946-?
4768-?	SIN	3954- 4155
4988-?	ATN	4180-?
5499-?	RND	4696- 4788
6581-?	Check for math symbol in crunch code	5760- 5796
6658-?	Load FPA1 from crunch code part 1	5837- 5861
6706-6759	Equation evaluation	5885- 5938
6759	JP (HL)	5938
6760- 6795	Get equation from crunch code	5939- 5974
6796- 6814	Stack setup	5975- 5993
6815- 6836	Find first line number address	5994- 6015
6837- 6867	Find next line number	6016- 6046
6868- 6894	END	6047- 6068
7231-?		
6895- 6939	TRACE routine	6069- 6111
6987- 7013	RUN	6159- 7013
7648-?		
7014- 7068	Execute loop	6190- 6246
7069-?	LET	6247- 6335
7419-?		
7163-?	TRACE	6336- 6340
7518-?		
7168-?	NOTRACE	6341- 6345
7654-?		
7172	SNLOAD,^@ (It's a return)	
7527		
7173- 7194	NEW	6356- 6377
7528-?		
7195-?	STOP	6378- 6386
7550-?		
7204-?	CONT	6387- 6422
7559-?		
7240- 7373	Command vector table	6423- 6554

7602- 7735		
7761-?	DIM	6942- 7172
8154-?		
8117-?	Check stack	7299- 7310
	LIST (Entry v1 @7407, v2 @ 8175 /(8597)/)	7387- 7554
8304-?	DEL	7555- 7704
7656-?		
	PRINT (Entry v1 @7854, v2 @ 8548 /(8970)/)	7740- 7899
8594- 8808	Print command errors	7900- 8109
8809- 8813	CLRERR	8109- 8113
9265-?		
8814-?	ONERR	8114- 8140
9020-?		
8841- 8943	CLEAR	8141- 8243
9270-?		
8944-?	DEF	8244- 8312
9373-?		
9013-?	RESUME	8313- 8341
9460-?		
9042- 9060	IF	7705- 7739
9489-?		
9061- 9102	GOTO	8342- 8380
9516-?		
9103-?	ON	8381- 8418
9550-?		
9138-?	REM or DATA	8419- 8246
9585-?	STORE or RECALL	11650-11773

9146-?	GOSUB	8427- 8476
9593-?		
9191-?	RETURN	8477- 8492
9638-?		
9207-?	POP	8493- 8515
9659-?		
9262-?	FOR	8557- 8752
9714-		
	NEXT (Entry v1 @8811, v2 @9516 (9939))	8753- 8956
9690-?	INPUT	8957- 9377
10183-?		
10072-?	GET	9378- 9481
10497-?		
10160-10184	RESTORE	9482- 9498
10619-?		
10185-?	READ	9499- 9986
10636-?		
10654-10703	Get memory address	9987-10041
10704-10734	CALL	10042-10072
11094-?		
10735-10752	USR	10073-10090
10753-?	PEEK	10091-10103
10766-?	POKE	10104-10125
11153-?		
10788-?	WAIT	10126-10163
11194-?		
10826-?	&	10164-10191

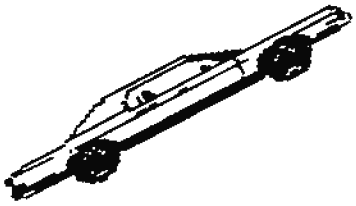
11223-?		
10852-10964	FRE	10192-10308
10965-?	VAL	10309-10350
11007-?	ASC	10351-10370
11027-?	CHR	10371-10410
11067-?	STR	10411-10453
11110-?	LEE	10454-10463
11164-?	LEFT	10508-10528
11185-?	RIGHT	10529-10552
	MID (Entry v1 @10563, v2 @11219)	10553-10615
11328-?	INT	10672-10813
11454-?	ERRHUN	10814-10831
11470-?	SPEED	10832-10843
11925-?		
11482-?	POS	10844-10856
11495-?	VPOS	10857-10869
11508-11647	LOMEM	10870-11009
11947-?		
11648-11687	HIMEM	11010-11049
12071-?		
11688-11731	Screen commands	11050-11098
12199-?		
11739-?	COLOR	11099-11118
12250-?		
11754-?	HCOLOR	11119-11138
12265-?		
11769-?	PLOT	11139-11169
12280-?		
11801-?	HLIN	11170-11218
12312-?		
11822-?	VLIN	11219-11267
12333-?		
11843-?	SCRN	11268-11319
11888-11897	HTAB	11320-11329
12399-?		
11898-?	VTAB	11330-11350
12049-?		
	DRAW (Entry v1 @11358, v2 @11950 (12461))	11351-11404
	XDRAW (Entry v1 @11412, v2 @11970 (12489))	11405-11458
11999-?	ROT	11459-11472
12510-?		
12009-?	SCALE	11473-11486
12520-?		
12019-?	HPLOT	11487-11618
12530-?		
12004-12109	PDL	11619-11649
12226-12241	Reset program pointers	11892-11919
12456-12471	Print character with PR	11994-12009
12472-12535	Print to printer	12010-12042
12983-?		
12536-12550	Print to screen	12043-12057
13047		
12551-12580	PR	12058-12083
13062-?		

12581-12606	IN	12084-12109	15624-?	Parse DEF	15125-15187
13092-?			15888-?		
12607-?	Print table	12110-12127	15731-15741	Parse RUN	15232-15242
12625-12633	Print a return	12128-12136	15987-?		
12634-12646	Input using IN	12137-12149	15742-?	Parse LIST, DEL	15243-15306
12647-12655	Print prompt	12150-12158	15998-?		
12656-12863	Input line	12159-12368	16042-16078	Parse INPUT	15543-15579
12864-12883	Control character table	12369-12386	16296-?		
12884-12923	Control address table	12387-12419	16079-?	Parse PRINT	15580-15634
12924-?	Vectored screen print	12420-12434	16338-?		
12939-?	Print return on screen	12435-12450	16255-?	Parse line number	15756-15813
13032-?	Look for line number	12520-12617	16408-?		
13476-?	Print (HL) with PR (for Print DE with Pr, v1 @12967, v2 @13483)	12959-13037	16320-?	Parse DATA, REM, or quotes	15814-15901
			16551-?		
15460-15474	Parse WAIT	14969-14975	16420-16434	Parse :	15911-15925
15637-?			16647-?		
15475-15489	Parse DRAW	14976-14990	16435-16447	Parse =	15926-15938
15775-?			16662-?		
15490-15518	Parse FOR	14991-15019	16448-16458	Parse ,	15939-15949
15668-?			16675-?		
15519-15533	Parse LET	15020-15034	16459-16471	Parse #	15950-15962
15697-?			16686-?		
15534-15591	Parse IF	15035-15092	16472-16485	Parse TO	15963-15976
15798-?			16694-?		
15592-15600	Parse POR	15093-15101	16486-16499	Parse AT	15977-15990
15848-?			16713-?		
15601-15623	Parse HPLOT	15102-15124	16500-?	Parse GOTO	15991-16006
15857-?			16727-?		

16770-16774	Print ASC in A	
16775-16776	NOP	
16777	Print character indicator	17009
16778	Flash character indicator	17010
16781	Device number for drive	16821
16786-16787	Start address of sprite table	
16788	Shape/Sprite flag	
16898	ASCII base	17004
16899	Current screen or graphics mode	17008
16938	ASCII code of cursor	16953
16939	ASCII code of blank character (space)	16954
16940	ASCII code of current character	16955
16941	Left margin for screen	16956
16942	Right margin for screen	16957
16943	Top margin for screen	16958
16944	Bottom margin for screen	16959
16948	Frequency of flashing	17011
16957	Number of lines on screen (y) for HOME	16993
16958	Number of columns on screen (x) for HOME	16994
16959	Starting line number for HOME	16995
16960	Starting column number for HOME	16996
16961-16962	Address in VRAM of name table	16997-16998
16963-16964	Address in VRAM of pattern table	16999-17000
16965	Current line (y) position of cursor	17001
16966	Current column (x) position of cursor	17002
16967	Blinking cursor indicator	17005
16968	ASCII base for cursor	17006
16969	Current name table	17007
16970	Current input byte	17003
16972-17003	Buffer for screen routines	16960-16991
17005-17031	Complete file entry in directory	16885-16911
17111	Current COLOR	16776
17113-17125	Temporary name of file in first file buffer	16796-16808
17163-17164	VRAM address of name table for flashing	17012-17013
17171-17349	Set PRIT	17046-17225
17350-17357	Pattern of a character	17226-17233
17358-17398	Print character	17234-17274
17399-17501	Read keyboard	17275-17333
17502-17570	Init screen	17334-17388
17571-17577	Reset (16777) to 0 (vl is 17009)	17389-17395
17578-17586	???	
17587-17609	Print cursor	17396-17415
17610-17641	Print with control characters	17416-17447
17642-17798	Print without control characters	17448-17610
17799-18165	Control printing routines	17611-17977
18166-18186	Clear buffer	17978-17998
18187-18234	Clear screen	17999-18046

18235-18272	Clear rest of line	18047-18084	20216-?	BLOAD	20993-21139
18273-18299	Read rest of line	18085-18111	20363-?	BRUN	21140-21143
18300-18384	Scroll screen	18112-18196	20368-?	CATALOG	21144-21330
18385-18433	Update cursor	18197-18245	20701-?	APPEND	21477-21714
18434-18453	Read character from screen	18246-18265	20771-?	POSITION	21715-21838
18454-18475	Calculate name table position	18266-18287	21503-?	READ	22049-22454
			21693-?	WRITE	22455-22922
18476-18491	Calculate pattern position	18288-18303	22066-?	NONON or NON (Entry for NON is 5 bytes higher)	23042-23230
18492-18508	Table of control ASCII	18304-18320			
18509-18542	Table of control addresses	18321-18354	22255-22272	Legal file ASCII	23231-23248
18543-18566	Calculate relative position	18355-18378	22294-?	Drive to device table	23263-23278
18567-18663	Print control-p	18379-18452	22394-?	Get drive number	23364-23476
18923-19078	Ctrl-d tape routines	19693-19883	22574-?	Get first file name	23324-23363
19079-19167	Immediate mode tape checker	19884-19970	23020-?	MERGE or LOAD or RUN (Entry v1 LOAD @23976, RUN @24012; v2 MERGE @23020, LOAD @23021, RUN @23065	23976-24053
19168-19298	Immediate tape routine	19971-20123			
19299-19315	First letters of commands	20124-20137	23353-?	Print file errors	24297-24418
19316-19503	Table of tape command ASCII	19316-19503	23479-23562	Close files	24419-24496
19504-19545	Vectors of immediate commands	20303-20338	23563-?	OPEN	24497-24611
19546-19601	Vectors of ctrl-d commands	20339-20388	23713-?	CLOSE	24612-24933
19602-?	Tape error ASCII	20389-20415	23868-?	PR	24934-24942
19629-?	PP or INT (Entry v1 INT @20416, PP @20419; v2 INT @19629, PP @19632	20416-20425	23877-?	IN	24943-24951
			24168-24179	Get lenght of name	25195-25206
19639-?	DELETE	20426-20468	24180-24307	EXTMEM or STDMEM (Entry for STDMEM @24200)	
19692-?	RENAME	20469-20531			
19755-?	RECOVER	20532-20639	24304-24393	ASCII for BASIC file name	25257-25266
			24394-24491	INIT	25267-25353
19863-?	LOCK or UNLOCK (Entry of LOCK is one byte higher)	20640-20729	24500-24507	Init's data	25362-25369
20072-?	BSAVE	20849-20992	24508-24543	TEXT	18453-18491

24544-?	INVERSE	26141-26150
24554-24565	NORMAL	26151-26162
24566-24579	FLASH	26163-26176
24580-24590	Home screen	19304-19314
24591-24618	Do HTAB	26191-26218
24619-?	Do VTAB	26219-26271
24670-24757	Load video registers with 3addresses	19315-1933
	Load video registers	19334-19347
	Fill name table	26272-26296
24758-24767	Set HGR2	25433-25483
24768-24916	GR	18492-18563
	Set GR	18609-18727
24917-24937	HGR2	25370-25411
24938-24955	HGR	25484-25600
24956-24979	Lo-res block	18564-18587
24980-24989	GR video addresses	18588-18608
	VRAM addresses for HGR	25412-25432
26389-?	Do PDL	26904-27486



Guy-R LaForest

OH, YES, YOU CAN!!

A POWERPAINT PRIMER

by P.J. HERRINGTON

There is a popular misconception among computer users that graphics design requires some sort of "natural" talent (whatever that may mean.) This couldn't be farther from the truth. It is not even necessary to be able to draw a straight line for one to do computer graphics; the computer itself can do that! Good graphics design DOES require certain skills, but these skills are attainable by EVERYONE. Of course, developing ANY new skill takes patience. In fact, patience is the single most important factor in graphics design, even after other skills have been mastered. In a nutshell, ANYONE WITH ENOUGH PATIENCE CAN LEARN TO DESIGN GRAPHICS.

LEARN WHAT IT IS THAT PLEASES YOU

Of course, some people will be faster to learn graphics design skills than others. However, the fastest learners are not necessarily people who know how to draw. They are the people who have a "good eye" for graphics, and already know what they like.

It is not difficult to develop a good eye. The trick is to spend time LOOKING at graphics from various sources, and deciding what appeals to our own taste. Ideas are all around us... in newspapers, magazines, greeting cards, needlepoint designs, and even in children's coloring books. Once we know what we would LIKE to do, we can figure out how to go about achieving it.

It's also important to study the computer graphics designed by other people, so we can get a sense of just what can be done, and how different effects are accomplished. We can then decide which ones we like, which we don't like, and WHY. That makes it much easier to see what we want to do in our own designs. Knowing what we want is the first step.

UNDERSTANDING THE PROCEDURE

Before we can design our own graphics, though, we must understand the mechanics of the graphics design PROGRAM: what it can do, and what buttons to push to cause things to happen. This first step is hardest for most people, because they are presented with a bewildering variety of options, none of them familiar.

Studying the manual helps, but the program cannot be learned by reading about it. Both reading and hands-on experimentation are required to learn ALL of the features of the program. Until the fundamental functions of the program are understood, there is little point in trying to develop advanced skills.

WHY POWERPAINT?

We will be exploring PowerPAINT (copyright, Digital Express) for three good reasons. First, it is by far the most popular graphics design program available for ADAM; second, it is supported by many other utility programs and finished volumes of graphics; and finally, it is the program used by the author.

WHAT DO WE NEED TO GET STARTED?

It is important to note that PowerPAINT does require a memory expander. It will work perfectly with a 64k card, but there is an advantage in having a larger expander. 128k doubles the size of the workspace. Anything larger than that allows for more files to be stored to RAM... as many files as the additional memory can accommodate.

Many people believe that PowerPAINT requires a dot matrix printer. Of course, such a printer is necessary to turn out hard copy graphics. However, there are many other ways in which PowerPAINT graphics can be used without a special printer.

They can be incorporated into BASIC programs in a variety of ways, and even used as opening screens to be displayed while a self-booting disk or datapack is being loaded.

Many people use them as title screens for their home movies.

Besides THAT, it's fun just to draw the graphics, whether or not they are ever to be printed.

Other peripherals that are nice to have include disk drives, a color monitor, (or a color TV with a good, clear picture), and a color printer. None of these are necessary, though. For example, while color adds an extra dimension, black and white graphics are just as interesting from a design standpoint.

In fact, while we are learning, we will find it much less confusing to limit ourselves to ONLY two colors. That is, all of the background should be one color, and the actual drawing should be done in just one foreground color. Any colors will do, but the default black and orange are hard for many people to see.

Graphic artist Tony Patterson suggests using grey for the background, and black for the foreground, because that combination is closest to the appearance of printed copy.

Personally, I prefer using cyan (light blue) for the background, because the various "cursor" shapes (squares, paintbrush, arrow) are white, and white is hard to see against a grey background.

Whatever color we choose, though, it is best to start out with a light-colored background and a black foreground. That keeps us from being confused. Everything that's black will print, and everything that's not, won't; period! Also, this simple color scheme lets us find any stray dots that might by accident be hidden in a multicolored picture.

LETS GET STARTED!

So, our first step will be to change the background color of our blank screen.

When PowerPAINT is loaded, the Primary Menu is displayed, showing the drawing screen is default black. One of the SmartKey options is labelled GLOBAL ART COLOR, (SmartKEYIII). Pressing this key branches us to a new set of SmartKeys, one of which is labelled GLOBAL BACKGROUND, (again SKII). We simply press this key, and use the arrow keys to choose our new color from the display, pressing RETURN when we have made our choice; and the "GLOBAL ART COLOR" screen returns to our view.

The entire background is now changed to the color we selected (let's call it cyan.) This affects only the cell we are using at the moment, (I assume that you have read about the screen "cells" in your copy of the PowerPAINT documentation). But if we want our entire workspace, (that is to say, all of the cells), to have the same background, we can achieve this easily by pressing the MOVE/COPY key and copying this cell to all of the others.

Now the trick is to make sure that anything we do from now on will blend into our picture, by changing the default colors in each mode we use during the session.

By pressing SKVI in the present "GLOBAL ART COLOR" change screen, the screen returns to the "PRIMARY MENU" screen, and we see that there are several different modes or types of graphics functions built into PowerPAINT, (SKs III, IV, V and VI).

Each mode or function has its own menu, and its own default colors. Each menu provides options for changing those colors, but some of the modes or functions draw only in foreground, so there is only one color to change Those in this category include DRAW FOREGROUND, PAINT GRAPHICS, and DRAW POLYGONS. ("DRAW POLYGONS" is a sub-option of the "POLYGONS AND MORE" option of the "PRIMARY MENU"). Whenever we use one of these functions, we will want to change the pen or brush color to black.

One of the available modes or functions draws ONLY background color, and that's DRAW BACKGROUND, (SKV). As long as we stick to a two-color scheme, we won't be using that mode very much, except perhaps to draw reference lines. (The default color for DRAW BACKGROUND is grey, and that works fine for reference lines.)

There are some modes or functions that use both foreground and background color. SPRITE ART, (a sub-option of the "POLYGONS AND MORE" option of the "PRIMARY MENU"), and TEXT (fonts), (a sub-option of the KEYBOARD function key "INSERT" while in the "PRIMARY MENU"); both use a default background of black. SPRITES use an orange foreground, and FONTS use a white foreground. Whenever we use one of these functions, we will need to make changes to both colors, (foreground to black, background to cyan), if we want everything to blend into our picture.

Fortunately for us, any color changes we make to any of these functions will remain until we turn the computer off. So we only have to bother with this the first time we use each menu. Of course, there is no reason to change anything in a mode we don't plan to use during a session.

CLIP ART, (another sub-option of the "POLYGONS AND MORE" option of the "PRIMARY MENU"), is a special case. Because Clips may consist of several different colors (in both foreground and background) the CLIP ART menu does NOT contain

default colors, nor does it have any options for changing color.

If we do decide to put a Clip on our screen and if we want to make it match everything else, we can go back to the Primary Menu and press GLOBAL ART COLOR again. This time, we use both GLOBAL BACKGROUND and GLOBAL FOREGROUND. No matter how many colors we have on our screen, everything will change to match our two-tone color scheme.

We can also use GLOBAL COLOR after loading full-screen pix, or if we have used Sprites or whatever without bothering to change default colors; or even if we have just changed our minds about what color scheme we want to use on our two-color picture.

We are going to be talking mostly about the various types of foreground drawing; but just for the record, there are also several different types of files that can be used with PowerPAINT. Not counting full-screen pictures, there are four: Sprite sets, Font sets, Brushes, and Clips. One of the nicest things about PowerPAINT is that it can hold one of each file type in memory at any given time, so we can work back and forth among them at will.

When PowerPAINT is loaded, the default files are in place. Any time we load a new file, it will replace the default file OF THE SAME TYPE, but leave the others intact. We can also have a different full-screen picture in each of four cells, (or eight cells, depending on the size of our memory expander).

PUT SOMETHING ON THE SCREEN

Okay, now let's draw something. From the Primary Menu, select the SmartKey labelled "DRAW FOREGROUND". A new set of keys will appear at the bottom of the screen, and an arrow will appear in the center of the screen. The very first thing we want to do is to press SmartKey V and change our pen color to black! (The color of the arrow does not change, but the image it will leave will be of the selected color, in this case, black).

The arrow points to the current position of the "pen". We can move the pen anywhere on the drawing screen, but we will see no results, because the pen is up, (see SKIII). In order to draw, we must press SmartKeyIII, (that toggles between "up" and "down"). As soon as we do, the pen will leave a line behind anytime we move it. We can erase the line by changing the pen to ERASE mode, and moving the arrow over the line. (SmartKey IV toggles between DRAW and ERASE.)

We can use the joystick to draw, or we can use the roller controller, but the finest, (most precise), control is achieved by using the arrow keys. We can get incredibly fine details by drawing one pixel at a time with the appropriate arrow key. Each keystroke will draw one tiny square dot, which we will call a "pixel", (short for "picture element"). That's the smallest unit on the screen so it is the smallest possible unit we can draw.

Straight lines are a snap. As long as we are dealing with true horizontal and true vertical lines, (90 degree angles to one another); the finished graphics are literally perfect.

The next easiest type of line is the forty five degree angle. To draw 45 degree lines, we hold down the CONTROL key and press any of the four arrow keys. The results are ALMOST perfect forty-fives. Try one or two of those now, using the the control and arrow keys simultaneously.

If we look at such a line under a magnifying glass, we will see that it is not actually perfect. Because it consists of many small squares, it starts to become a bit "jagged" as the squares are placed in different locations other than directly above or directly to the side of the previous "small square". Still, the lines appear straight to the eye; we can barely see the edges of the individual pixels.

We will be better able to see this "jaggedness" when we try to draw acute angles. The sharper the angle, the more imperfect the line will appear. This can be frustrating, but we need to remember that the printed copy will appear less jagged than what we see on the screen. The pixels actually print out very small, and the eye of the beholder will be fooled into seeing a reasonably straight line.

To draw an acute angle, we need to estimate how tall the line will be in relation to its width across the screen (actually, the width of its "base", were we to imagine it to be the hypotenuse of a triangle). We can try different combinations of height of the line in relation to the width to get the angle we want.

Actually, we wouldn't really need to do this for ourselves. The alternative is to let the computer do the work, and draw acute angles from the DRAW POLYGONS menu, (the sub-option of the "POLYGONS AND MORE" option discussed above). That would be faster, and wouldn't require any forethought. But that wouldn't do much to help us develop our "eye". At this stage of the game, we really need to experiment on our own.

So, press the SK to put the pen down, and let's just see what we get when we go up two pixels and over one pixel, repeating the process until the line is as long as we like; then try going up three pixels and over one pixel, and so on. That way we will get a feel for the different possible angles. Again, we get the best control by using the arrow keys.

Now let's try drawing some curved lines. Circles can also be drawn from the DRAW POLYGONS menu, but we need to learn to do it ourselves, because we will eventually want to make different types of curves other than "perfect" circles. (Circles drawn from square pixels are, of course, not literally perfect, no matter what technique is used).

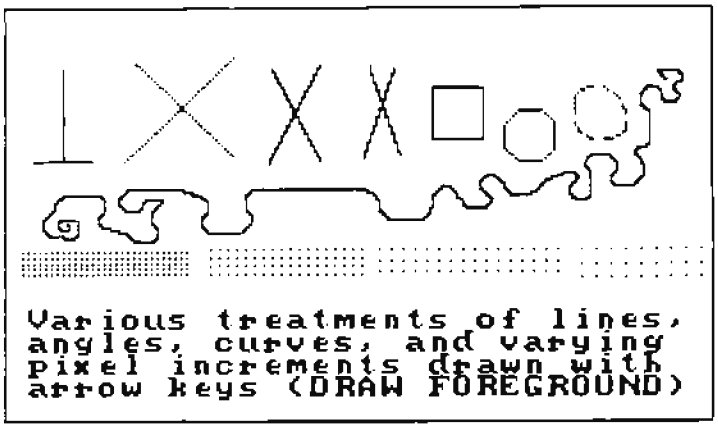
Let's experiment by drawing various sizes of squares and erasing their corners. Then we'll try different ways of placing pixels so that the corners appear to be rounded. Try that for a moment before we continue. Remember, SKIV toggles between DRAW MODE and ERASE MODE.

We can even draw dotted lines. If we press the key labelled PIXEL INCREMENT, and enter the number 2 <RETURN> our pen will draw every other pixel. From now on, all our lines will be "perforated", drawing one pixel, skipping the next, and so on. This also allows us to shade our drawing in half tones. Or, we can change the pen mode to ERASE and erase every other pixel on a solid shape. Play around with this function for a few minutes before we proceed.

We can choose other pixel increments, too. This is one simple way to add shading and patterns to our drawings. When we want our solid line back, we press PIXEL INCREMENT again, and enter the number 1.

We won't perfect our line drawing skills at one sitting. We will want to practice more in future sessions. But it doesn't take too long to get a general feel for the types of lines we can draw.

Once we've experimented for awhile with drawing our own straight lines, angles, and curves, we are ready to try DRAW POLYGONS. It will be interesting to compare the lines we drew with the lines the computer can do for us. (As we progress, we will find that there are times we actually like ours better!)



Various treatments of lines, angles, curves, and varying pixel increments drawn with arrow keys (DRAW FOREGROUND)

FIGURE 1

Let's return to the Primary Menu and press the Smart Key labelled "POLYGONS AND MORE", (SKIII); then the "DRAW POLYGONS" key, (SKIV). Again, the first thing we want to do is change the color to black, so that whatever we draw will blend into our present picture. Pressing Smartkey V allows us to change POLYGON COLOR, so change it to black. With that accomplished then, let's experiment with the different types of polygon drawing.

We will learn that there are some limitations. DRAW CIRCLES, for example, will not draw very tiny circles, such as the size of a text letter "o". We have to be able to draw those ourselves. It won't draw very large circles either. And it won't draw ovals at all.

But we can draw almost any shape with STRAIGHT LINE, by breaking the shape into small straight line segments and connecting them one by one.

Pressing STRAIGHT LINE, we then use the arrow keys to place the starting point, and fix it into place with RETURN. We use the same method to move to each new end-point, and set it in place. Each time we press RETURN, the computer will draw a line between the two end points, (coordinates), we selected, and we can move onto the next point.

(Actually the screen asks us to select the SECOND COORDINATE each time even if it is the sixtieth coordinate. It probably should read "NEXT" instead of "SECOND", but it doesn't, so what the heck).

(There is a bug in the program that can cause it to lock up. It's been so long since I encountered the bug that I'm not sure what it is, but I think that it occurs when RETURN is pressed twice in a row, without a change in the position of the coordinate. That's easy to avoid, but the best way to be sure it never happens is to purchase PAINTAIDE, (copyright, Digital Express), and follow the instructions which will fix the bug. You won't be sorry you bought PAINTAIDE in any case. It includes a lot of useful information, as well as a huge collection of font files, ("The Swift Font Kit")).

When the drawing is complete, we press ESCAPE to return to the DRAW POLYGONS menu.

DRAW POLYGONS is an excellent way to draw for people who like geometry. For example, people who like to draw shapes on graph paper and then break them up into segments, computing their mathematical coordinates, will have a lot of fun with this mode.

But for the most part, that does not describe the way I work. I usually just make everything up as I go along, and I usually don't keep track of specific coordinates. For

instance, in the DRAW CIRCLE mode, the computer asks us to choose a center point, and then input the size of the radius. Unless I have been counting pixels, I have to guess just how wide I want the radius to be. This gets easier with experience, of course; but in the beginning there is a lot of experimentation and guesswork.

Fortunately, PowerPAINT makes it easy to start over when the results are not what we expected. From most menus, we can simply hit UNDO before returning to the Primary Menu.

But that doesn't work from the DRAW POLYGON menu. Instead, if we don't like what we've done, we press SmartKey VI to return to the Primary Menu. We are then asked, "ARE RESULTS OKAY?" If we do NOT like the results, we simply say so, and everything we added from the DRAW POLYGONS menu is instantly erased, leaving whatever else was on the screen before we entered POLYGONS. Nothing could be easier.

(If you do several additions to your picture in the DRAW POLYGONS/POLYGONS mode, it would be safer to return to Primary Menu after each so that several good additions would not be erased with one bad addition).

From what we've done so far, it would seem that drawing graphics is SLOW. Well, yes, when we are trying to get pixel-by-pixel detail, it IS slow. But there are many other ways of getting graphics onscreen. Depending what we want to do, we can speed up the process quite a bit.

Let's try an exercise in drawing frames or borders, and see just how much faster we can go. Let's do an exercise that starts with a blank screen, (the cyan screen), and draw a border 8 square pixels at a time. To begin, we make sure that we are in the Primary Menu, and choose SKV, etc., to change our foreground color to black, so that whatever we type will blend in with the rest of our picture; and we hit the INSERT key.

Then we choose the SmartKey labelled NORMAL TEXT. This is the menu that allows us to use the keyboard to enter text on our screen. We're not going to enter any of the common visible text characters just now. This time, we will be using only the Space Bar.

Since the "space" created by the space bar is in fact a character, (a "blank"), it can be used with regular fonts to erase large sections of graphics, in 8-pixel squares.

This time however, we want to DRAW large sections of graphics, so we will press the SmartKey labelled CHANGE FONTS, and choose REVERSE FONTS. Now we can use the arrow keys to position the hollow white square which represents the "cursor". From now on, whenever we hit the Space Bar, a solid black square, (or space), will appear at the location of the cursor.

Let's use the Space Bar to draw a small border. For now we will keep it back a little bit from the side edges of the screen, so that it will be easier to see later. (Most monitors make it hard to see the last pixel or two at the far right edge). Let's just make a rectangle, with a hollow center. It can be any size, it doesn't have to be a border around the whole screen. In fact, it wouldn't hurt to draw TWO borders, so we can try a couple of different treatments.

FIGURE 2

When we're through, let's CHANGE FONTS, (SKIII), back to regular Fonts, just so we won't get confused if we return to this menu later. It doesn't matter which Fonts we choose. Any selection, (including "REVERSE FONTS", since it is a toggle), will get us out of REVERSE mode. (If we prefer to keep the original Font set, we choose SYSTEM FONTS, (SKIII).

Okay, now let's return to the Primary Menu and go back into DRAW FOREGROUND.

We can now use the pen in ERASE mode, (SKIV toggle), to draw lines within the border, (or, more accurately, to "undraw" them). First try just a plain line in the exact center of each side, (remembering to lift the pen while placing it into its starting position); then try making a second line; or try making the lines thicker on two sides, or try erasing diagonal lines at each corner. Just experiment and see what happens.

Don't draw or erase anything in the second frame, though; we are going to try something different there.

FIGURE 3

When we tire of fooling around in DRAW FOREGROUND, let's return to the Primary Menu and see what we can do with

Brushes. There is no SmartKey labelled Brushes. We access that mode by pressing the key labelled PAINT GRAPHICS. Then select SKY BRUSH COLOR, and make the brush color black.

Now, what we want to do is to select any Brush design and use it in Erase mode. We can't see the Brush design on the screen. All we see is a "cursor" shaped like a paintbrush. Whatever graphic design we choose will appear on the screen only AFTER we move the Brush.

To choose a shape, we press SELECT BRUSH. The center of the screen will display the shape of the current Brush. We can cycle through all the choices by pressing the down arrow key or the up arrow key. When we decide which one we like best, we press RETURN, and the display disappears. We can no longer see the pattern we chose.

This time, we want the Brush to be in ERASE mode, so we press SmartKey I, labelled DRAW MODE. This "toggles us" to ERASE mode. Then we press SmartKey II labelled BRUSH UP. That key toggles, too; our Brush is now in the down position. Wherever we move the Brush, we will erase graphics in our chosen pattern. Let's pass the Brush over our frame with the arrow keys, and see what happens. If we don't like the results, we can press UNDO. We will be asked if we really want to UNDO the changes. If we say yes, we return to the Primary Menu with our original picture intact, and can start over if we like.

FIGURE 4

Now we will try drawing a frame or border using JUST our Brushes. This is even faster. Each of the built-in Brushes is 16 pixels square (FOUR TIMES the size of the square we were using from the font menu). One Brush is a solid square.

Starting with a blank screen, (with the same cyan background color), we'll go back into the DRAW GRAPHICS menu and select the solid-shaped Brush. Again, we want to stick to our color scheme, so we will press BRUSH COLOR and select black instead of the default orange. If our Brush is in ERASE mode, let's change it to DRAW. If the Brush is in the DOWN position, we'll change it to UP until we move a bit towards the center of the screen. Then we'll put it back down and draw a framework of 16 pixel squares; so go ahead and make a small border on the screen.

FIGURE 5

Now it gets a bit tricky. We want to SELECT a different Brush (ANY different brush), so select one if you please.

Then we'll put the Brush UP, and change the Pixel Increment to 8, (SKIV). Then we'll move the Brush tip so that it is halfway between the top of the top border and the bottom of the top border, and change it to ERASE mode. Now we'll put the Brush back down, and try to erase just half the frame in the pattern we chose. But we won't get exactly the same pattern, because we are now moving in 8-pixel increments instead of 16, so our brush will be "overlaying" itself halfway across its width.

FIGURE 6

A danger exists here because by changing the pixel increment, it makes it possible to overwrite the border of the PowerPAINT screen, so we want to move very slowly and pick the Brush up before we come close to the edges of the screen. (Otherwise we may erase some of the PowerPAINT menu screen).

Also, because there is a buffer built into PowerPAINT, it is easy to move too fast. This is true in some of the other menus, too, but it's particularly important in DRAW GRAPHICS. We need to take our time when using Brushes, and especially when using them with increments other than 16.

If we DO get too carried away and make a mistake, we can always go back to the good old UNDO key.

Once we've ERASEd just half the border, we can choose to go back to the Primary Menu and touch it up from DRAW

FOREGROUND. Now about if we erase two corners, draw a line around the patterned portion for better definition, and perhaps draw angles in some of the corners. DRAW FOREGROUND gives us the fine control necessary to do such things.

FIGURE 7

Guess what? We are designing graphics!

We have developed a sort of "feel" for drawing narrow lines, in both DRAW FOREGROUND and DRAW POLYGONS, and we have learned to draw oversized lines with Fonts and Brushes. We are now ready to experiment with drawing pictures.

At this point, it might be best to practice by modifying a picture someone else has already drawn for us. There are literally hundreds of pictures available on public domain volumes, as well as commercial graphics packages. Most people tend to amass huge collections of predrawn graphics, and with good reason.

Many of the projects we will undertake can be accomplished much more quickly by starting with completed pictures and altering them to suit our purposes. Such shortcuts save valuable time. There's not much point in drawing something from scratch when somebody has already done the work, and all we have to do is alter it a little bit.

For the moment, though, let's assume that we don't have any other graphics volumes handy. No problem! We can practice with one of the full-screen "pix" contained on the PowerPAINT medium.

There are several different formats of "pix" in the directory, placed there to show that PowerPAINT can handle different picture formats... including RLE, HRP, and others. HRP pictures consist of four separate files, but we can access the entire picture by pointing to any of the four files. In this case, though, let's GET one of the pictures in PowerPAINT format (binary 10k file). Let's get the picture named SAILING1.

No matter what its format, each of the pictures is the size of one PowerPAINT screen. When we load one of these pictures, we will eliminate anything showing on our current screen. If we want to keep our current screen, we can move to a different cell prior to loading a picture.

To change cells, we make sure we are in the Primary Menu, and then press any number from 1 to 4, (of course, if our memory expander is larger than 64k, we have 8 full cells at our disposal, and can press any number from 1 to 8 to move to that cell). Remember, we can have a different screen in each of those cells.

So, let's load our picture. Press the STORE/GET key, then SmartKey V, "READ MEDIUM". Select SAILING1 with the arrow keys, then press SmartKey II, labelled GET FILE. PowerPAINT will now load that picture into whichever cell we happen to have moved to just prior to GETting the file.

The first thing we will notice is that the background and foreground color are different from the colors we have decided to use. So our first step is to go into GLOBAL ART COLOR and change all the background to cyan, and then all the foreground to black. Now we are on familiar ground again.

Let's see;... what kinds of changes shall we make? There is nothing wrong with the picture as it stands, but we need the practice, so let's try the following:

First, let's change the size and shape of the sails. Let's make them taller.

While we're at it, let's eliminate the diagonal lines in the sky, add a flag or pennant to the mast, make the sailboat a little bit longer, and shade the path in the foreground.

Let's also erase some of the lines in the clouds so that they appear lighter.

First of all, we have some erasing to do. So let's go back into Primary Menu, and press DRAW FOREGROUND; and start erasing the diagonal lines and parts of the sails. This gets tedious very quickly. That's where the PATTERNS comes in! There isn't much we can do to speed up the erasure of small details, but there IS a faster way to eliminate large sections of graphics.

Ready? Go back to the Primary Menu, and hit the keyboard INSERT key. When the message section at the bottom of the screen changes, choose NORMAL TEXT.

We are back to the menu which allows us to add letters to the screen. We have already seen that we can also use this menu with REVERSE FONTS to draw 8-pixel square sections of graphics. Now, we will use the same procedure with regular

Fonts to ERASE sections of the same size. If we've already changed the background color to cyan during this session, it hasn't changed. If not, let's do it now.

Once again, we will see the hollow square "cursor" which shows where text would be entered if we hit a character key from the keyboard. Again, we can move the cursor without affecting our screen by using the arrow keys. Wherever we move the square, we can erase anything on our screen by pressing the Space Bar.

When we "erase" in this manner, what we are actually doing is replacing the original graphics with font graphics, in both foreground and background. Since the Space Bar contains no foreground color, the effect is that the entire beneath the "space square" becomes background color. As long as the new background color is the same as the original background color, the only change we will see on the screen is that the foreground disappears.

If we get too energetic and erase more than we intended, we simply hit the UNDO key and return to the original drawing. (We will be asked if we really want to UNDO our changes. Yes, we do).

We won't be able to erase everything this way. Some dots (pixels) will fall outside the square. To get rid of those, we need to return to the Primary Menu and go back to DRAW FOREGROUND. Then we will use our pen in ERASE mode and attack those stray dots until we've eliminated everything we don't want on our screen.

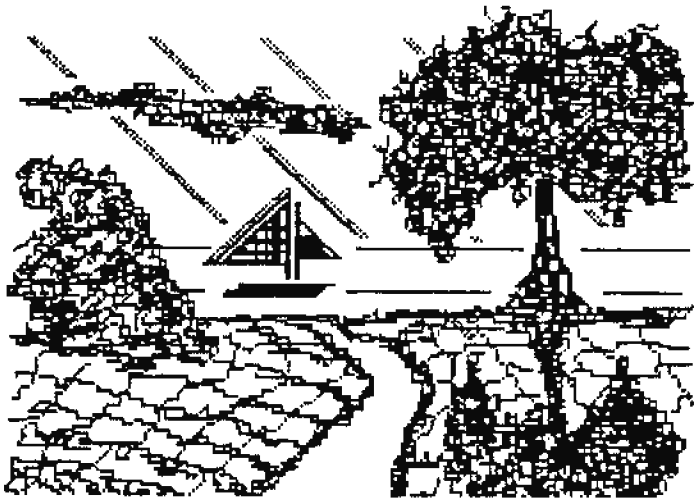


FIGURE 8

Okay. Once we have erased what we don't want, let's add our own details. While still in the DRAW FOREGROUND menu, we toggle our pen back into DRAW mode. Now we will try to draw the sails in a different shape. Let's try picking a starting point for the left-hand sail, and drawing a line angling upwards to the mast by hitting the arrow keys repeatedly in this manner: up twice, right oncem up twice, right once, and so on until we reach the top of the mast.

hitting the arrow keys repeatedly in this manner: up twice, right oncem up twice, right once, and so on until we reach the top of the mast.

To draw the sail on the right side, we will make the angle a little bit steeper by hitting up three times, left once, and so on until we reach the top.

Then lets draw some sort of pennant at the top, freehand.

Next we'll hollow out the clouds a little bit, by erasing some of the interior lines.

Then we will add a little bit of length to the sailboat itself.

Last of all, we'll shade in the path or sidewalk. To do this, we change PIXEL INCREMENT to 2, and draw between the left and the right boundaries.

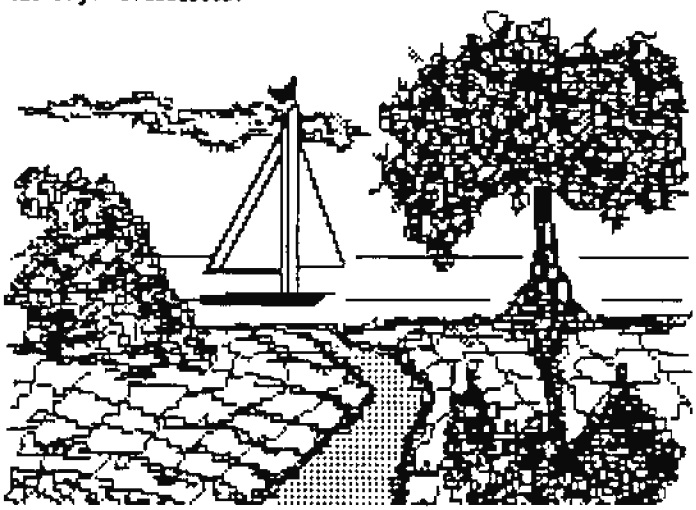


FIGURE 9

Does your finished picture look anything like mine in figure 9? It really doesn't matter how similar or dissimillar they may be. The point to this exercise is not to copy a picture. The idea is to discover some of the ways in which we can alter an existing picture to suit ourselves.

Now it's time to plunge right in and draw a picture from scratch. Well, fine,.... but WHAT should we draw? If we don't have some ideas rumbling around in our heads, now is the time to make use of outside sources.

Children's coloring books are an excellent source of "inspiration", because they contain big, clear line drawings, usually very basic in shape, which are just about the right size for one PowerPAINT screen.

I wish that, when I was first learning this program, somebody had told ME about coloring books!

There are many different ways to transfer a drawing from a book to the screen, and I didn't learn any of them until I had been doing graphics for a long time, which is probably why I still don't use them much. Some methods I developed myself, and some I learned from other people, but they are all great tricks.

For instance, it's easier to transfer a picture if we divide the picture into small squares and copy the contents of each square onto the computer screen. We can divide the coloring book page into squares by simply folding it, or we can draw lines directly on the picture. (The latter technique is a little bit harder because the lines must be more or less square and proportionate, but pencil lines ARE easier to see than folds.)

When the picture itself has been divided into squares, it's easy to put squares on the computer screen... in BACKGROUND color, so it doesn't interfere with drawing.

There is a graphics volume called POWERTOOLS (distributed by Reedy Software) that contains prepared grids. Even if we don't have POWERTOOLS handy, we can easily make our own grids of background color by hitting INSERT and Normal Text. Then it's a simple matter to change background colors.

After deciding how large we want our squares to be, we hit the SPACE BAR to get an 8-pixel square of whatever new color we chose. We can use as many colors we like, in any combination, to get a grid that consists solely of background color squares. We can then transfer the contents of the printed page to the onscreen squares. When we are through drawing, we can go back to GLOBAL ART COLOR and change the entire background back to one color.

The grid technique is good for another reason. If we are drawing something that we may later want to move around, the grid makes it easy to see what portions of the picture can be moved at the same time.

Thanks to Joe Quinn for passing on a technique used by retired commercial artist James Casey. James transfers drawings onto plastic film, using some sort of transparent marker. (I imagine the type of marker used for overhead transparencies would work, as well as the erasable type used for white marker boards.) James then places the plastic sheet over the computer screen, and draws UNDER it.

I don't know what color scheme he uses for this, but it seems likely that he uses the same type of pale background and dark foreground that we've already discussed. The foreground drawing in black should show right through the transparent lines made by the marker.

Tony Patterson liked the idea a lot. He took it a step farther. Tony draws DIRECTLY on the monitor screen with erasable marker, eliminating the problem of positioning the plastic. Again, the black lines will show up underneath the marker, making it easy to see where to move the arrow.

For those who like to draw their own pictures from scratch, this may be the easiest technique of all. Of course, plastic would be better for those who are reluctant to mark up their monitor screens, even though it's unlikely that erasable marker would do any permanent damage. To each his own, eh?

Another good thing to bear in mind is that silhouettes are sometimes more effective than line drawings. That is, a solid black picture makes a striking printout. The same drawing can be used, by filling in the outline and using ERASE mode to add details. This is especially effective when the shape is simple and requires few extra details.

Before we get too far ahead of ourselves, though, let's try a simple exercise in drawing a picture from our own imagination. Let's try something very basic: A plain line drawing of a coffeepot. Don't try anything fancy just yet. Keep it straightforward. Again, it doesn't matter whether your drawing looks anything like mine. Take it easy and have fun. The point is to prove to yourself that you CAN design your own pictures.

Go ahead. Go into the DRAW FOREGROUND menu and draw your coffeepot now. Make it fairly large, but keep it simple. I'll wait.....

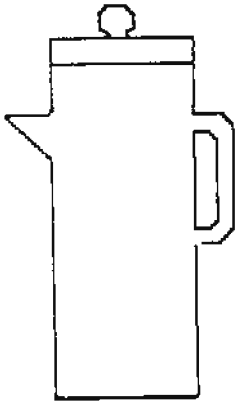


FIGURE 10a

Done? Good. Now let's to look at another way to use Brushes.

Let's make sure we are in the Primary Menu, and, once again,

press the SmartKey labelled PAINT GRAPHICS. Again, if we've already changed the Brush color to black during this session, fine; otherwise, we'll do it now.

This time, we want to be certain that we'll be moving in increments of 16 pixels. If we aren't sure, we'll press the key labelled PIXEL INCREMENT and check. Returning frm that screen, we will press the SmartKey labelled SELECT BRUSH. When our screen changes to display the current Brush, we'll use the arrow keys to cycle through the set of Brushes currently in memory, and make our selection by pressing RETURN. (Choose any Brush pattern you like, but for this exercise, do not choose the solid square shape).

Also, make sure the Brush is in DRAW mode, and that its status is UP.

Now, we'll move the white paint brush "cursor" that shows on the screen, until it is next to the edge of our coffeepot drawing. Then we'll change the status of the Brush to DOWN. From now on, wherever we move our Brush, we will leave foreground graphics in the pattern of the Brush we chose.

Move the Brush around the drawing until the entire coffeepot is filled with the pattern. We will soon learn that we cannot keep the pattern entirely within the lines. Some of the graphics will spill over into the background surrounding our picture.

That's life. As long as the coffeepot is filled, we're okay. We can live with the excess for awhile.

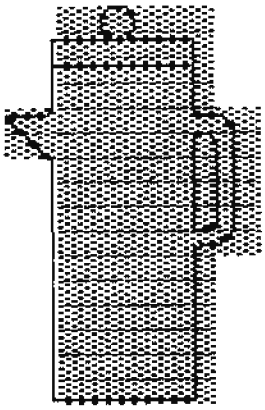


FIGURE 10b

When we've filled the coffeepot, we return to the Primary Menu and go back into DRAW FOREGROUND. We now change our pen to erase mode, and erase all the parts of the pattern which fall outside the outline of the coffeepot.

YES, this is tedious. NO, there is no quick way to do it. Again, that's where PATTERNS comes into the picture. But after we've erased all OF the excess graphics, we have a coffeepot that is shaded in with whatever pattern we chose.

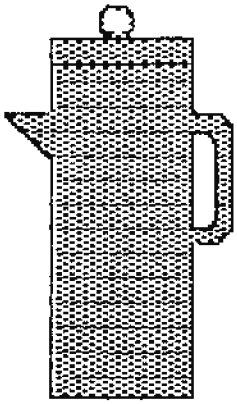


FIGURE 10c

We've just scratched the surface as far as Brushes are concerned. We could go back and choose a SECOND pattern, and overlay it in certain areas to get a more three- dimensional effect. Or we could change the Brush to ERASE mode, and erase certain areas of the picture. There are a lot of wonderful things that can be done with Brushes.

When you are ready to learn more about Brushes, you'll want to purchase POWERTOOLS, read the docs carefully, and play with the many different sized Brushes contained on the medium.

Because they come in so many sizes and shapes, they are far more flexible than the Brushes contained on the PowerPAINT medium. Some of them are QUITE small, and those are the very best ones. Not only can they shade in smaller areas with less spillover, but they can be used from within the Paint Graphics menu to draw calligraphy and all sorts of other unusual effects, simply by changing Pixel Increment to 1.

It's also possible to design your very own sets of Brushes by using the PD program "Shapemaker", by Guy Cousineau. But for now, you have mastered the basic concepts required to use the built-in PowerPAINT Brushes.

The only real problem with Brushes is that the pattern doesn't appear onscreen until after the Brush passes over the screen segment. Therefore, it can be a little tough to visualize exactly where the graphics will be drawn.

It's important to keep in mind that, if we don't like the results, we can always hit UNDO before returning to the Primary Menu, in order to eliminate whatever we just drew. In fact, as mentioned before, it's a very good idea to return to the Primary Menu every so often, even if we DO like the results so far. That way, hitting UNDO will erase only what we did most recently, (since we returned from the Primary Menu). That makes it possible for us to experiment, a little

Menu). That makes it possible for us to experiment, a little at a time, without having to erase things that turned out well, that we want to keep. This is good practice when using other menus, too, but it is especially helpful in Paint Graphics.

We are now reaching the point where we will be experimenting with pictures that we will want to keep. One way to prevent losing pictures we like is to store them to another cell BEFORE we try any experimental changes that we may decide we don't like.

Let's say we want to find out what would happen to our picture if we erased some portions and added graphics to other portions; but just in case we have second thoughts about any changes, we want to be able to get our first file back.

Well, we can SAVE the file to disk or datapack. We need to do that periodically, anyway, because if the power goes out we are stuck with whatever we last SAVEd. But we can quickly fill up a medium if we store every interim version of a picture in progress.

While we are making small changes, it makes more sense to take advantage of any cells in our workspace that aren't currently being used for anything else. We can use all of our blank cells as a sort of clipboard by copying our picture to as many cells as we like.

For example, if we are working only in Cell 1, we can return to the Primary Menu and press the MOVE/COPY key. Then we choose the SmartKey labelled COPY CELL, and specify which cell we want to use for our backup version. We can copy to more than one cell, if we want to; or we can reserve the spare cells for further intermediate versions of the work in progress, as we make more experimental changes.

It's also a good idea to keep our backup versions in cells OTHER than cell one and cell two, and reserve the first two cells for our main work, because those are the cells that will print whenever we choose to "Print Header".

Let's try a header. If you saved your altered version of the SAILING picture on which we worked earlier, load that picture into Cell One now. (If you didn't save it, no matter. Just load the original SAILING1 pic into Cell One).

Now, press the MOVE/COPY key and COPY CELL to Cell Two. We now have the same picture in Cell One and Cell Two. What we want to do is center the drawing between the two cells, and add some text on each side of the drawing.

We'll go back to the MOVE/COPY key and choose PULL PICTURE. We are given a choice between pulling the entire screen and pulling a row at a time.

The latter choice comes in handy when we are trying to center text, but that's not what we want to do this time. Instead, we choose PULL SCREEN. Then we use the arrow keys to pull the entire picture in Cell One toward the right of the screen. Each keystroke will move the picture 8 pixels. The screen is 240 pixels wide. (It's numbered from 0 to 239; computer people tend to use the zero instead of number ONE for first positions. The first position on the screen is not 1, but 0; the last position is not 240, but 239. That's just how programmers are).

In any case, we can move the picture exactly half way to the right by hitting the right arrow key FIFTEEN TIMES.

Then we return to the Primary Menu, and hit 2 to move to the second cell. Next, we hit MOVE/COPY again and repeat the process, only this time, we move the screen 15 places toward

(See next page)

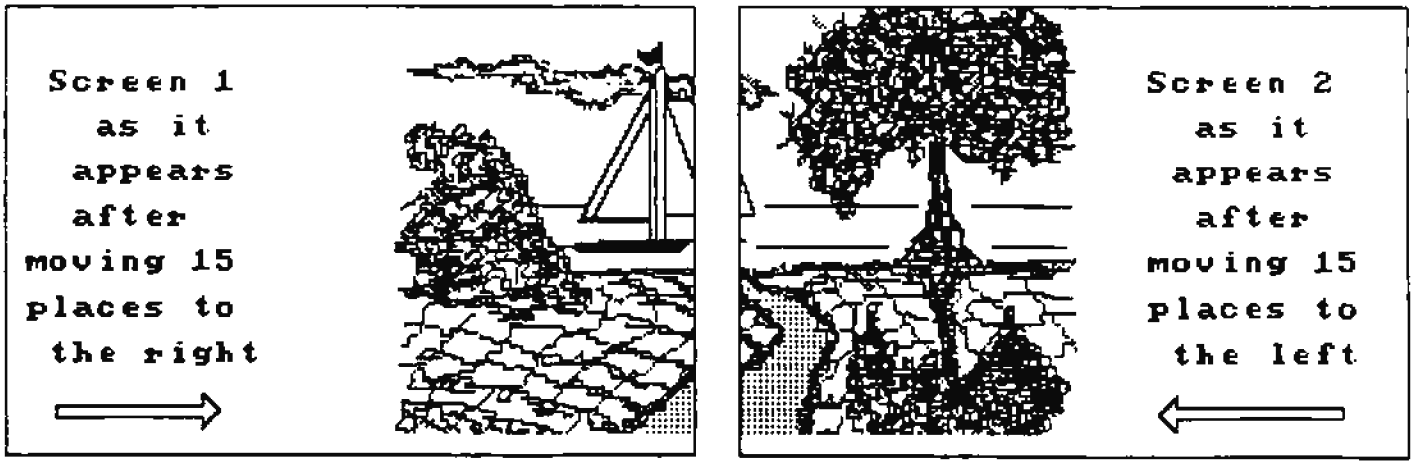


FIGURE 11

the LEFT. Our picture is now centered between the two cells, and we can add whatever we want to add to the left and right.

We will notice that, after we pulled the screens, the area where the picture USED to be has changed back to the default black background. We can change that, if we want, by returning to the Primary Menu and choosing GLOBAL ART COLOR. We are now pretty familiar with using Global Background to make our background color uniform.

This is a good time to practice inserting text. From the Primary Menu, press INSERT, and choose NORMAL TEXT. Now we can type in any words we choose from the keyboard.

Let's try changing the Fonts to Bold Fonts. Type in some sort of text. Then, just for variety, let's choose CHANGE FONTS again and, this time, select Reverse Fonts. Whatever we type in from now on will be the opposite of regular fonts. That is, background becomes foreground, and vice versa. To get out of the inverse mode, we can select any other Font style.

We can also choose User Fonts. If we have previously loaded a Font set from another source, it will show up in this mode. Otherwise, we will see the default User Fonts, which are not letters, but miscellaneous shapes. (Those shapes can be lots of fun, but that's a different subject. Experiment with those on your own, some day when you have some spare time).

After we've typed in our message, we will return to the Primary Menu and go back into DRAW FOREGROUND. Now we can draw some sort of border around the pictures. In Cell One, let's draw a border around just the left side, the top, and the bottom; leaving the right side free. In Cell Two, we'll do the same thing in reverse, leaving the left side open.

(assuming, of course, that we have a dot matrix printer connected), we go back to the Primary Menu and hit the PRINT key, then choose Print Header, Normal Foreground, and Dark Hardcopy. (We could choose Light Hardcopy if we wished, but as a rule, it's better not to choose Reverse Foreground. That option prints all the background and not the foreground. Since most pictures have a lot of blank space in the background, printing that portion of the picture can eat up printer ribbons very quickly).

If we PRINT either a header or an entire workspace, our only options are to choose between Light and Dark Hardcopy and to choose Normal or Reverse foreground.

But if we print out just one cell at a time, we have other options. We can choose from several widths, several heights, and we have various choices of where we want the left margin to appear on the paper.

The widths are given in inches. The normal width corresponds to selection "4" inches. Choosing a width of "4" will print out a picture in the same proportions as those we see on the screen. Any other choice will give us a printout that is distorted in some way, either in height, or width; unless the width is doubled and the height is also doubled.

Sometimes this is desireable. Many people like to print a screen using a width of 8 and double length. That kind of printout retains the original proportions of the drawing on the screen, but the printout is double the size that it would have been if "4" had been chosen.

(Actually it is QUADRUPLE in size. Doubling the width and the height quadruples the overall area).

Bear in mind that enlarging the picture will emphasize the square edges of the individual pixels. (For example if width

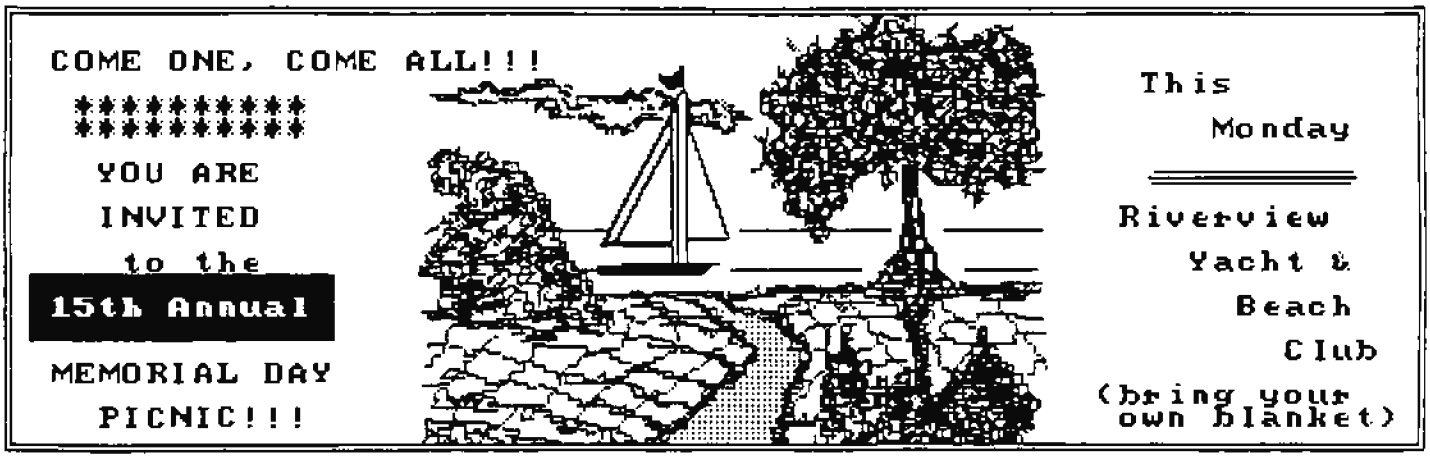


FIGURE 12

We now have a perfectly centered header. To print it, and length are both doubled, as suggested in one case cited

above, each pixel now becomes a 4 pixel square, since the program doesn't know how we would have wanted the larger images rounded when they were expanded).

Printing at quadruple length will make the make angular lines of the picture appear even more jagged.

Choosing a width of 3, on the other hand, can have a "smoothing" effect when used with normal length.

The only really practical way to become familiar with the effects resultant of having selected any one of the different possibilities is to experiment with all the various combinations.

Again, these options are available ONLY when we are printing a single screen.

Now that we've seen how to center a picture horizontally between two screens, how do you suppose we would do the same thing vertically? Or even horizontally AND vertically? Hint: the screen is 160 pixels in height, and when using the Pull Screen function from the MOVE/COPY menu, we can move in 8-pixel increments.

I will leave this as an exercise for the reader. We have already used up far more than the space allotted to us by the editors, and we haven't even touched on the use of color. We also haven't talked much about Sprites and Clips; but both of those functions use already prepared graphics, and they will seem easy to you now.

Both Sprites and Clips are accessed from the POLYGONS AND MORE menu.

SPRITE ART uses the default Sprite set, and CLIP ART will display the default stocking clip, unless we have previously loaded a new file of either type.

Remember that PowerPAINT can keep one of each file type in memory at any given time, and that when a new file is loaded, it replaces the default file of the same file type.

When a Sprite file or a Clip file is loaded, it will remain invisible until we go into the POLYGONS AND MORE menu and choose either SPRITE ART or CLIP ART.

There are many Sprite and Clip files available. Besides the extra files on the PowerPAINT medium itself, you can find many, many file types on commercially prepared graphics volumes, for a truly incredible number of choices.

Both Sprites and Clips are positioned with the arrow keys, and fixed in place with RETURN. And any time we use Sprites, Clips, or Fonts, they will replace anything that was in the area before they were stamped in place... both foreground and background.

The only types of graphics which do NOT replace existing graphics are the ones we have already explored... Draw Foreground, Draw Polygons, and Brushes... and one type we DIDN'T discuss: the Special Text function from the INSERT menu, (while it is in OVERLAY mode).

These types of graphics will overlay whatever is on the screen without replacing any portion of the background or the foreground.

We also didn't go as far with MOVE/COPY as I'd have liked to have gone. This is one of the the things that makes a big difference in making up graphic screens.

The whole POINT of doing graphics with the computer is to be able to draw a segment of a design and then repeat it as often as we like, wherever we like. It's really an important menu, so please DO explore it on your own. It can be used to set a frame around any section of the screen, from 8 pixels square to 64 pixels square, or any size in between as long as it falls within 8-pixel increments (say, 16 pixels by 32 pixels, or 24 pixels by 48 pixels).

The contents of the frame can then be ERASED, MOVED, or COPIED to any section of the screen, or even to another screen entirely.

(Pressing Control plus the U or D keys lets us MOVE or COPY to a different cell... Control U for UP, or a higher numbered cell; Control D for DOWN, or a lower numbered cell).

ERASE is self-explanatory.

COPY lets us put the contents of the frame in a new location, while retaining the original graphics in the original location.

MOVE is just a little bit tricky.

MOVE lets us move the contents of the frame to a new location, either in the same cell or another cell, while at the same time deleting the original graphics from the original location. However... and THIS IS IMPORTANT... this works ONLY if the new location is ENTIRELY different. If any part of the new location overlaps any part of the original location, the graphics will be deleted from the original location WITHOUT being moved to a new location. Nor is there

any way to recover them!

If we want to move to a new location that partially overlaps the old location, we have to use COPY instead. Then we can follow up with ERASE if necessary, or use any of the other erasing techniques we have learned.

We can also use the Pull Screen function of MOVE/COPY to erase large sections of graphics along any of the four edges of a screen with the arrow keys, by pulling the entire screen until it obscures the unwanted portion of the picture, and then pulling the rest of the picture back.

Again, move slowly. It is easy to move your fingers faster than the buffer allows, and erase to much. If this happens, don't panic! just press UNDO, and start over!

Maybe we'll get into color next time. But I want to leave you with a few final thoughts that didn't fit anywhere else.

It's important to remember that, because PowerPAINT uses your extended memory, you really should turn the computer OFF after a session with PowerPAINT, before using any other program that might need that memory. In fact, if your printer is hooked up to the same power strip, that will reset the printer, too, which needs to be done before you try to use another print program.

(If you don't reset the printer before printing with some other program, and you find that your lines of text are too close together, or the pitch is wrong, etc.; just turn your printer off and back on). Actually, it is always a good idea to turn the computer off after using ANY program that accesses extended memory. (Thanks to Faye Deere and David Cobley for this tip).

We don't have room to go into detail about support programs, design utilities, and pre-drawn graphics, but the more of these packages you acquire, the more it will all come together for you. Some, like SimplePainter and Shapemaker, are even Public Domain.

One commercial package that I would recommend to everyone is POWERTOOLS. I'm not the most objective person about this volume, but I do believe it contains files which would be useful to everyone from beginner to ace. It contains lots of interlocking sprite sets, some fonts, giant letters, and so on, but it would be worth the price just for the special brushes and the manual.

My second best choice would be SpritePOWER, (copyright, Digital Express), because experimenting with sprites can go a long way toward developing that "good eye" we were talking about.

You'll probably also want to buy Clip Art Viewer (copyright, Walters Software), and lots of clip volumes. In fact, you will eventually probably want just about every graphics package you can find.

I'm not aware of any volumes that would be BAD choices. And that includes pre-drawn graphics, too. Remember that the designers of these packages don't do anything you can't do, if you think of it, and if you have enough time. But they DO save you an enormous amount of work, and keep you from having to re-invent the wheel.

Collect whatever you can, whenever you can, as the budget permits. But no matter how many volumes you collect, keep on working on your own projects.

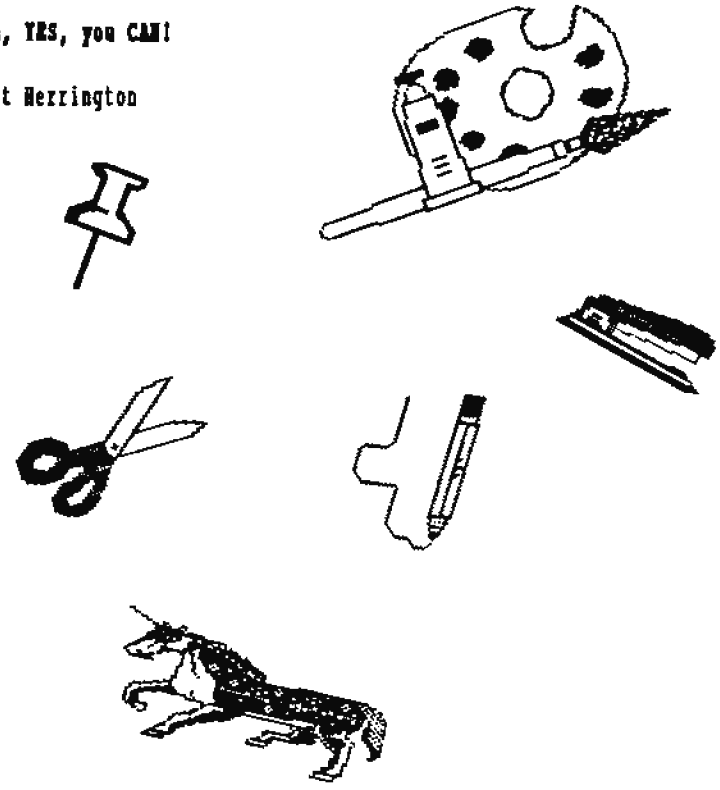
Above all, don't let ANYONE kid you that you need "talent" to design graphics.

What you need is interest, time, and about a truckload of patience. And you need to keep an eye peeled for interesting ideas.

The rest will all come with practice, and you WILL get faster.- Honest. It won't be long before you are actually amazing yourself with what you are producing.

Oh, YES, you CAN!

Pat Herrington



TELECOMMUNICATIONS

by Bart Lynch

It wasn't long after I purchased my Adam that I started expanding my horizons. Like everyone else I suppose, my first steps with Adam were booting Buck Rogers and writing letters with SmartWriter. About a year later, (much to my delight), I discovered a user group in my own area! This alone gave me access to a lot of information. And this eventually lead me to the wonderful world of telecommunications.

Armed with my trusty AdamLink modem and AdamLinkII software, (having quickly replaced the worthless AdamLinkI), I set about timidly and with trepidity, to tread the waters of the bulletin board world.

The Bulletin Board System, (or "BBS" for short), is an extraordinary way to exchange information. But in the beginning, it can be a bit intimidating.

There were times when I felt like I was in over my head. There was only one local BBS that had an alleged "Adam" section. The entries into the Adam section turned out to be mostly me, calling each day to see if anyone had called. For the most part they hadn't, and the BBS eventually folded.

A few months later, my local AUG newsletter had an article about another local BBS with an Adam section. The BBS was called Brigadoon, and was run on a Commodore C-64. The SysOp, (for System Operator); Doug Campbell, taught me much about bulletin boards in general.

WHAT IS A BBS?

It may sound silly to say, but when you get down to it, all a BBS is, is a computer someone has connected to a telephone line through a modem. The sysop has set this computer up for YOUR use, whether for short periods of time or 24 hours a day. Sometimes this "system" is "dedicated" as a BBS. Sometimes the sysop needs to use the computer or the telephone himself on occasion, hence the BBS is only "up" part of the time. Either way, it's a great place for computer users to hang out!

I learned a lot about sysops and bulletin boards from Doug. I learned the ups and downs. I learned about "crashing" a BBS, which is when the BBS program quits working, either through some BBS program "bug", or as the result of a malicious user. (I hasten to point out I WAS NOT the latter!)
I learned the importance of keeping a conversation going. It was great fun!

WHAT CAN A BBS DO FOR ME?

But what exactly IS a BBS, I mean in the sense of what can the user get out of it, and how? I've read many articles that have tried to describe it and failed. Let's add to that list of articles now!

A BBS is a computer program, (actually, a collection of programs), that you use to control within certain defined parameters. This control is done through the use of your own computer, using an especially designed program to do so. With that program in your computer, you control the BBS computer within the limitations of the BBS program that it has available for your use.

There are a wide range of choices in these BBS programs, but mostly it comes down to two things. One is that there is a message base, and the other is that there are files; program files or text files.

GET FILES

Most people, (Adam owners especially), contact a BBS to get those program files. These are called "downloads", and the files are generally programs that you can "run" on your computer. Through the "DOWNLOAD" procedure, these files are taken from a media at the BBS location, placed into the memory of the computer which is operating the BBS program, transmitted through the BBS's modem, through phone lines, into your modem and computer, and ultimately onto a media in a device of your own.

This is a terrific way to get new programs! You don't need to mail orders off to some company. You don't have to type in endless program lines from some magazine article or someone elses printout. The program is right there, ready to run.

(But one must exercise some caution! I do remember one of my biggest mistakes was thinking I could download ANYTHING and run it on Adam. Of course that is not true, it has to be an Adam program to begin with)!

TALK TO OTHER COMPUTER OWNERS

I think that what I like best about bulletin boards is the personal communication. Messages are left, (sort of like CB radio, yet sort of like typing a letter.), "conversations" are ongoing, jokes are shared and information is exchanged. You can find answers to your questions, or help someone else out with a tip of your own. And in general, you just have a good time.

All you need to connect yourself to that great outside world is a modem and the software to operate it.

I started out with the AdamLink internal 300 baud modem, but there are two problems with this today.

Foremost is the fact that as I write this, (FEB '91), AdamLink modems are getting scarce. I suggest you try one of the many Adam vendors listed elsewhere in this book. There ARE some available.

The second problem is that many bulletin boards are prejudiced against 300 baud, (the "baud rate" is a measure of how fast information can be transferred from the user to the BBS and back again. 300 baud is slow, and some BBSs won't even let you connect at that speed. This need not necessarily be a major concern to those with the ADAM, as ALL "Adam-only" bulletin boards will let you connect at 300 baud.

STARTING OUT

To begin your own experimenting with telecommunications, I suggest that you start out locally. Check a computer store for local computer magazines. The magazines will have the BBS listings for those BBSs in your area. Then RUN your telecomm program, and use it to dial one up. It's much easier to do your experimenting locally, ("easier", in this case, is spelled "C" "H" "E" "A" "P" "E" "R"), because you're not racking up long distance phone charges at the same time.

It's always a good idea to let the sysop know that you are new to using a modem. Don't be shy! Every sysop I've ever dealt with has been happy to help out. They LOVE to show off their systems!

Bear in mind what I've already intimated. A BBS is more generally a computer in someones house. While "online", make every attempt to act like a guest in that home. Behave with courtesy and you'll find that things go much more smoothly.

And don't be afraid to participate! While there probably won't be any Adamites there, (in fact, they will most likely be IBM, APPLE or COMMODORE users), there should be some general topics. Most boards on which I have been, have had other topics besides computers!

Once you've "mastered" such terms as upload, download, ASCII, feedback, chat, posting and such; it's time to hit those "Adam-only" boards. This is where the real fun begins. Just pick a BBS from the enclosed BBS list and give a call. It would be nice to say that the closest one to you would have the cheapest long distance rate, but "it just don't work that way". For instance, a call from Kent, Wa., (where I live, near Seattle), to Champlain NY, is roughly 5 dollars per hour. A call to Cleveland OH, (which is MUCH closer), costs 7 dollars per hour!

AND NOW FOR SOME DETAILS

Now let me talk about what happens after the first connection to a particular BBS in a little more detail. (I will assume here that you can follow the instructions in your telecomm program, and make the connection telephone connection to the BBS).

A-NET BBS'S

Inasmuch as I'm more familiar with the A-NET BBSs than others in general, let's start there.

There are some differences among the individual A-NET boards. Some are minor and some are major. But there are enough similarities that I can give a general outline.

INITIAL DISPLAYS

Upon connecting, you'll see a few lines, telling you who created the BBS, (Alan Neeley of ADAM-LINK of UTAH); usually followed by a few more lines telling you who made the particular modifications to the software being run.

But bearing up bravely through all of the introductions, at some point you'll be told to press "RETURN".

HANDLE, ID$, AND PASSWORD

Having done that, you'll be asked for your "handle" or ID$. Since this is your first visit to this BBS, you don't have either so simply type in "NEW".

The BBS will prompt you to give it a "handle" by which you may identify yourself in future visits. This "handle" can be a favorite fictional character, or something that describes you personally; or you can just use your name.

You will also be asked to supply a password, (just like with

any other BBS). The BBS will generate and notify you of your ID#, (to be used on that BBS in the future). It's good to keep this plus the password handy. While you can "logon" the next time with your handle, the ID# gets you on faster. And on long distance telephone calls, time is money.

PERSONAL INFORMATION REQUESTED

You'll also be asked to enter what's known as "new user feedback". This may be such things as; how long you've had your Adam, what add-ons you have, your main area of interest, etc. Enter as much as you wish. This information helps the sysop determine your access level, among other things. And while you ponder over what it is about yourself that you are willing to reveal, be aware that ONLY the sysop sees this info.

When you have finished typing and want to save your text to the BBS, press "RETURN", type a period, (","), followed by an "S", followed by another "RETURN". ("RETURN", ".", "S", "RETURN"). This whole "new-user" logon takes about 5-10 minutes. Everything you see from this point on you'll see every time you log on.

WELCOME

Some A-NETs prompt you with "SKIP WELCOME? Y/N", while others bypass this feature. The "welcome" tells you who the last caller was, if the sysop is present, etc. If you DON'T wish to read the "WELCOME", press "Y". If you DO want to read it, press "N".

NEWS

After this part comes the news. This usually alerts the user to some of the special things happening on the BBS, although sometimes it tells of the latest developments in the Adam world.

"xx/Main:" PROMPT

Finally, (after following all of the instrucions on the screen), you're taken to the "xx/Main:" prompt. The "xx/Main:" prompt consists of two letters, (xx), preceding the characters "/Main". These two letters differ from BBS to BBS, depending on what A-NET you're on. For example, the St.Louis Adam Users' Group is "SL/Main:",the trading post is "TP/Main", and so on.

HELP AVAILABLE

At this point,there are many options. It's important to remember that by typing a question mark, you can see a menu displaying those options. (NOTE: this works on ALL bulletin boards, not just the A-NETs!)

MESSAGE BASES

One of the options is to go to the message bases. That's easy enough; just enter a "M". This defaults you to message base 1. There are several message bases. Some boards have 4 but at least one A-NET bulletin board, (TAPPS BBS in Toronto Canada), has 15 message bases!

SCANNING TOPICS

Once you arrive at the message base prompt, you can enter "S" to scan the topics. These topics will be displayed with a number in front,like so:

1.HELLO!
2.AIM
3.ADAMCOM03
4.2400 baud
5.Monitor

READ A TOPIC

If you wish to read a topic of your choice, enter "R", "M", (where "R" is the letter "R" from the alphabet, but "M" is not. "M" in this case represents the number of the topic you are selecting. For example, if you wanted to read the topic "ADAMCOM03" from the selection above, you would enter "R", "3". This will display the message string that the above example BBS has stored about ADAMCOM03. (You can do the same directly from the "xx/Main:" prompt by entering "R" plus "M", again "M" being the number of the topic you want to see).

NO MESSAGE ENTERING FOR FIRST TIMERS

Be advised however, that as a new user, (that is, since this is your first visit to this particular BBS), you won't be able to reply to the messages or post one of your own. Once you make your second call, however, you should be able to participate.

SECOND, ETC., TIMERS

After that first visit to the BBS, when you subsequently visit the message base area; you'll see something different after the message string is displayed. This will be a prompt to allow you to <R>espond to the message, <Q>uit the message read, or go to the next message. You may also post your own message at the message base prompt by entering "P". Whether

you post or respond, just remember to save it as you did on the new user feedback I mentioned earlier, using "RETURN", the "dot command" of ".S" and "RETURN", ("RETURN", ".", "S", "RETURN).

LISTING MESSAGE BASES

Remember that I said that there is more than one message base? To find the others, enter an "L" at the message base prompt to list them. This works like the "scan" function mentioned above. When you find a message base in which you are interested, enter its number. (Note: The "List" option does NOT work from the "xx/Main:" prompt).

UPLOAD/DOWNLOAD

GETTING THERE

And getting to those all important ADAM programs is just as simple. The upload/download section, "UD", is set up much like the message base. To get there, enter "UD" at the "xx/Main:" prompt. This defaults to the UD1, the first file section. To view the many different download areas, enter "L" when you have arrived at the default UD1.

FINDING WHAT IS AVAILABLE

And to see what is in the individual file sections, enter "S" to "S"can.

Downloading and uploading on A-nets is for ASCII files only! That means that they can be accessed by software like AdamLINKII, SwiftLink, or SmartTerm. These "ASCII" file programs are those that can be run on SmartBASIC. No machine language programs can be downloaded or uploaded, unless the ASCII values of the Z80 instruction code are what are being loaded.

This type of ASCII file can be converted to a regular machine language file using SmartBASIC to load the values to the desired location in RAM, and then creating a binary file with a "BSAVE... " instruction. The method is much the same as is used to convert machine language routines from DATA stateements to binary files.

This type of binary file would work well in the ROS environment, but some fancy manipulation using available utilities would be required to convert the files for use in the T-DOS environment.

DOING THE A-NET DOWNLOAD

Downloading is easy. Just <S>can, and while scanning, note the number in front of the download you want. Then enter "D". The BBS will prompt you for the file number, which when provided, will then display a description of the file, and ask if that is correct. Just answer "Y" if it is, and you can commence to download.

OTHER A-NET FEATURES

There are many more features on the A-NET.

Go to the "WALL", where you can scribble graffiti or read that of some other "scribbler".

Check the "Adam BBS" area for numbers of all of the boards across the US and Canada.

Check the "G" files for special information.

And be sure to visit the "ECHO" where you can communicate with the users of nine a-nets all over the continent!

ADAM-NET BBS'S

The other major Adam-only BBS is called ADAM-NET. There are several differences between A-NET and ADAM-NET. One of them is that; while the A-NET is ROS based, (it's written in SmartBasic); the ADAM-NET is a CPM based system written in machine language. This results in a faster BBS on ADAM-NET, because Basic slows the A-NET down.

POSTING MESSAGES

Also, the ADAM-NET's message base is set up to be slightly different from that of A-NET. Instead of responding to individual message strings, all you do is "Post". Therefore, after reading through a batch of posts you "reply" to some subject you've read, by "Posting" a new message yourself.

Just as you do on the A-NET, you enter "P" to post. The BBS prompts you to name a "Subject:".

It also asks to whom the post is directed. So you could enter "Bart Lynch", or whoever; or even "all" if you're asking for advice and want ANYone to answer. To save your words of wit, you enter two carriage returns, then "S"; ("RETURN", "RETURN", "S").

MULTIPLE MESSAGE BASES

The ADAM-NET too, offers more than one message base. When you first log on, you are at the "Main:" prompt. To get to the messages, enter "M". This defaults you to the general area. Many people think that the ADAM-NET has only this one message base. That is because this general area gets a LOT of posts!

But take the time to explore.

Just enter "C" at the "General)" prompt, and the next message base title appears. Keep hitting "C" and you'll cycle through them all, back to "General)".

READING THE POSTS

To read the posts, type "R". The BBS will then display:

"Message #600-895",

and ask you at which message to start. Once you enter a number, that post is displayed; at the end of which you are asked to press any key. This will display the next message in numerical order. And so on.

An easier way to read is to hit "R", "C"; for "Read Continuously" and then use "control S" to stop the text display. The "scrolling" continues when you press any key.

READING THE "NEW" POST, ON-LINE OR OFF-LINE

Another feature is the "Read New" option. This allows you to read all new posts since your last visit. (A-NET does not have this feature except in it's echo base). I find this feature of ADAM-NET a tremendous time saver, especially when used with the "C" command.

This way, I can go in, "download" the messages, and read them off-line at my leisure. To do that, I enter "R", "C","N", (Read Continous New), and away I go! As I said, it's a time saver and that means it is a money saver too!

GETTING TO AND LOOKING AT THE DOWNLOAD AREAS

Getting to the download area is simple here too. At any prompt, enter "F". Again, there are many download areas.

To change areas, enter "C". To view the file titles in a particular area, enter "F-". Be prepared; ADAM-NET has LOTS of files.

DOING THE ADAM-NET DOWNLOAD

As this is a CPM based BBS, the download process is different than that of A-NET. The ADAM-NET BBS supports several "protocols", or ways of downloading. Each protocol is peculiar to the type of telecomm program that you are running.

(Be advised that AdamLink WON'T work here. Yes, I know, Adamlink 3+ purportedly has "xmodem" capabilities, but I've never heard of anyone having much luck with it)!

All of the 'program' files in the download area run under T-DOS, the enhanced replacement of CPM.

There are however, many 'text' files. These can be "typed out" and read on-line. Files with the last four characters, (the suffix, or "file type extension"), ".txt",".doc" or ".art" can be viewed this way. For example, "ADAMCOM03.TXT" could be read on-line by typing "S", (for show); or "S","C", (for show continuously): a very nice feature indeed!

SOME BETTER TELECOMM PROGRAMS FOR ADAM-NET

As noted, this is a CPM BBS. To best accomplish its downloads, I strongly suggest a CPM telecomm program, like MADAM? or MEX. The excellent thing about these two programs is that they are PD, (read this with the following pronunciation: "P" "D" "P" "D"!).

The best way to get these programs is to write to Rob Friedman who is kind enough to send them out. Just send him a blank tape or disk along with RETURN POSTAGE. Ask him about his "modem.glv" offer and tell him what all you have attached to your Adam. Then sit back and wait.

SOME GENERAL INFORMATION

I am now at the point in this mindless drivel where I'm trying to be sure I've written everything that I had set out to write. So I'll throw some things in at this point that don't seem to fit anywhere else in particular.

All of the BBS boards to which I have given reference accept 300 and 1200 baud at least. The ADAM-NET even goes up to 2400 baud. (As of this writing, the A-NETS are beginning to go 2400 baud as well.)

Most BBSs are open 24 hours but PLEASE note the hours on the BBS list. Some are limited-hour boards with the phone line in use AS A REGULAR TELEPHONE at other times.

Bear in mind too, the times in the different time zones across the continent. Unless otherwise specified, times quoted for a BBS are to be considered as local times to the BBS in question.

Since I first discovered "modeming", I've been hooked. There is just something about it that has gotten into my blood. It has been my pleasure to share this "addiction" with you. Maybe some of what hooked me will hook you too!

COMPUSERVE, A "NATIONAL BBS"

(The following article, written by Rob Friedman, the ADAM CP/M SysOp for CompuServe; was downloaded from Compuserve 4/11/91)

CompuServe is a national telecommunications network for any and all computer users.

For ADAM users, it's a national meeting place and a central source of public domain software, both basic and CP/M.

We are located in the Computer Club forum, one of the oldest forums on CompuServe. The ADAM is in sections 9 and 10, and has Data Libraries 9 & 10. Section 9 is Adamania, for BASIC and LOGO files, and anything else that can be downloaded via AdamLink2. (More on that in a bit).

Section 10 is the ADAM CP/M section; usually requiring a CP/M modem program such as Madam7, MBI114, IMP, IMP15, or QTERM42G in order ot download. (Again, more on that in a bit). As a meeting place, there are on-going discussions in the message bases, and in the weekly COnference (Sunday nite 10:00 ET). There we exchange ideas, tell about new items for ADAM users, and just make friends.

Both Tim Munes and I are there almost every night, and are available sunday night in the CO.

Also, in our Data Libraries, we have a wealth of PD software, including the latest PD CP/M files, (also available in the CPM Forum). We have amassed an impressive amount of software including no less than six CP/M programming languages, (Bbasic, Bprolog, TinyPascal, Forth, Pilot, and Cobol), and we have the only place on CompuServe that the CP/M user, (not just ADAMites), can download the original adventure game known as the "Colassel Cave". We are also a distribution point for T-DOS, Tony Morehen's superb CP/M "workalike".

Our BASIC section, combined with our CP/M section constitute the largest Data Libraries in the Forum for any one computer.

The Computer Club forum can be reached on CompuServe at any "!" prompt by typing "GO CLUB". We look forward to seeing you there.

But, CompuServe isn't just a single Club for Adam users. If you have other interests, (which I hope we all do), you can find them on CompuServe.

As I mentioned, ADAM users can also access the CP/M Forum (GO CP/M) and use almost any program on there. (If your friends with their C-128s tell you that "They have a section there too", well... they are right... BUT ADAM runs CP/M much better than the C-128).

But, if you have other interests, (and I hope we all do), like science fiction, Midi software, religion, health, home business, and countless others.. you will probably find a section for you on CompuServe.

There are also the online multi-player games like Mega Wars, YGI (You Guessed It), and Island of Kesmai.

You can also talk to people all over the US and Canada, (and lately), around the world, on the CompuServe CB, (where I'm a frequent visitor).

Or, as in the film WarGames, you can book flights or check on flights with the OAG, (Official Airline Guide-Electronic Edition).

If you are doing research and you need information; there is also "IQuest", an immense database that can send a printed copy to you, or send a file via modem for numerous topics and previously published sources. (Who knows?? Maybe the paper you write will also end up in IQuest).

Also, there is the Electronic Mall, where you can purchase almost anything from your home.

Your home banking and financial needs can also be met on CompuServe. (Just wait until April 13th and see how crowded the tax help services become).

CompuServe is the largest online information service in the world with over 380,000 members.

To join CompuServe, you need;

a) a modem,
b) a terminal program, and
c) a CompuServe starter kit, (available from most computer stores and major bookstores).

The hourly charge is $6.00 per 300 baud and $12.50 per 1200 or 2400 baud. There is no longer any prime time and non-prime time. I hope to see you there.

Rob Friedman, (Sysop ADAM CP/M)

As a service I have been distributing the PD Modem programs, AdamLink2, Madam7, and MBI, for the internal modem. My procedure has been a very reasonable one. I ask you to send a formatted CP/M disk or DDP, (or 2 or 3, depending on what you want sent). AdamLink2 doesnt require a CP/M format.

And also please send return postage, no fee other than that, and I'll send you a copy of the program so that you can access all of the Data Libraries.

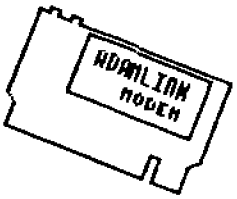
I call the package "MODEM.GIV", and it needs 2 160K disks. I also have 2 other "GIV"aways. One I call "EXTRA.GIV", which is simply more stuff. The other is a generic T-DOS called "TDOS.GIV". It will run on ANY Adam and can be re-installed for any ADAM not running Micro Innovation attachments. (Those already come with TDOS).

On CIS and on several BBS's as well as printed in MOAUG is an article called "TDOS.GIV". Please let me know if you have any questions. You can find Tim and I online with these User I.D's.

Rob Friedman ---User I.D> 76702,417
Tim Hunes ------User I.D> 73307,215

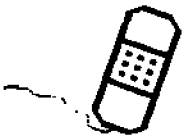
Also.. Ron Collins is technical assistance person online. Along with Ron, some of our figures are Tony Morehan of T-DOS fame, John Moore of Madam? fame, Pat Herrington who runs the MOAUG, Rick Lefko author of numerous articles, Alan Neeley author of the A-Net BBS's and the SLC Adam User Group and numerous others. So.. come join the crowd.

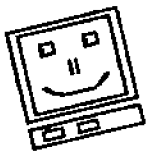
Rob Friedman
3814 Ocean Ave. T-2
East Rockaway, NY, 11518
516-593-8798
Updated 4/13/91
Rob Friedman



SEE YOU ON THE BOARDS

Mart Lynch





A LIST OF BBS-S

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**********************************
***   A LIST OF YOUR FAVORITE   ***
***   ADAM BBS Phone Numbers!   ***
***    (A) Denotes A-NET BBS    ***
*** ECHO = A-NET ECHO MAIL SYS. ***
***                            ***
*** If ya KNOW 'em Then ADD 'em ***
**********************************
```

Name : SLC ADAM-LINK BBS ECHO
Hrs/Baud : 6P-8A & WWDS 1200/300
Phone : (801)/484-5114 PCP/LINK
PCP/SLink#: UTSLC - 534
Sysop : Alan Neeley (ALAN)
Posted : Sun Jun 3, 1990 6:23 PM

Name : THE TRADING POST ECHO
Hrs/Baud : 24HRS 1200/300 Baud
Phone : (216)/791-4022 PCP/LINK
PCP/SLink#: OHCLE - 4222
Sysop : Herman L Mason (HERMAN)
Voice Ph.#: (216)/231-8813
Posted : Sun Jun 3, 1990 6:23 PM

Name : THE ST. LOUIS AUG ECHO
Hrs/Baud : THR-SUN 9P-6A 1200/300
Phone : (314)/383-3617 PCP/LINK
PCP/SLink#: MOSLO - 8979
Sysop : Al Fitzgerald (SHAMAN)
Posted : Sun Jun 3, 1990 8:23 PM

Name : T.A.P.P.S. BBS ECHO
Hrs/Baud : 9A - 2A 24Hrs Wkn 12/3B
Phone : (416)/741-2432 8-1-N
PCP/SLink#: N/A
Sysop : Terry Cairns
Posted : Sun Jun 3, 1990 6:23 PM

Name : CONNECTION BBS ECHO
Hrs/Baud : 24HRS 1200/300 Baud
Phone : (518)/298-4294 8-N-1
PCP/SLink#: N/A
Sysop : Steve Major CONNECTION
Posted : Sun Jun 3, 1990 6:23 PM

Name : CAT'S LAIR (A-NET) ECH
Hrs/Baud : 300/1200 BAUD
Phone : (802)/295-2550
PCP/SLink#: N/A
Sysop : PETER AMES (BLACKPW)
Posted : Sun Oct 8, 1990 1:26 A

Name : THE COLECO DEPOT ECHO
Hrs/Baud : 8P - 12A 300 Baud ONLY
Phone : (718)/848-3066
PCP/SLink#: NYNYO/ N/A
Sysop : DARRYL QUINN
Posted : Mon Aug 2, 1990 2:38 PM

Name : MON-BRAU-ADAM ECHO
Hrs/Baud : 24 HOURS/7 DAYS
Phone : (514)/474-3756
PCP/SLink#: N/A
Sysop : LEAVE E Mail IF U KNOW
Posted : Mon Jan 2, 1991 9:48 PM

Name : ADAM eXchange
Hrs/Baud : 24HRS 24/12/300 BAUD
Phone : (216)/883-9355
PCP/SLink#: OHCLE/4222
Sysop : GEORGE K.
Posted : Sun Jun 3, 1990 6:23 PM

Name : PHOENIX ADAM-LINK
Hrs/Baud : 24HRS 1200/300 Baud
Phone : (602)/936-3892 PCP/LINK
PCP/SLink#: AZPHO - 9532
Sysop : Rusty Gillott (RUSTY)
Posted : Sun Jun 3, 1990 6:23

Name : AWAUG
Hrs/Baud : 24HR 300/1200/2400 Baud
Phone : (202)/561-2475 PCP
PCP/SLink#: DCWAS - N/A
Sysop : Jeff Jodoin
Posted : Sun Jun 3, 1990 6:23 PM

Name : CLEVELAND FREE-NET
Hrs/Baud : 24HR 2400/1200/300 Baud
Phone : (216)/368-3888 PCP/LINK
PCP/SLink#: OHCLE - 4222
Sysop : Herman Mason Jr (AA337)
Posted : Sun Jun 3, 1990 6:23 PM

Name : COMPUTER WISE GUYS
Hrs/Baud : 24HRS 300 Baud
Phone : (404)/424-6258 PCP/LINK
PCP/SLink#: GAATL - 8795
Sysop : SCOTT BANLEY
Posted : Thu Mar 9, 1989 8:28 PM

Name : GARDEN OF EDEN
Hrs/Baud : 24HRS 300 Baud
Phone : (404)/445-0723 PCP/LINK
PCP/SLink#: GAATL - 8795
Sysop : Sherman Murddock
Posted : Thu Mar 9, 1989 8:28 PM

Name : TONY'S CORNER
Hrs/Baud : 24HRS 3/12/2400 8 1 N
Phone : (313)/754-1131 PCP/LINK
PCP/SLink#: MIDET - 5968
Sysop : Tony Bauman
Posted : Thu Nov 8, 1988 8:28 PM

Name : ADAM LINK IN NEW JERSY
Hrs/Baud : 24HRS 300 Baud
Phone : (201)/224-5764 PCP
Sysop : Fred Vicente
Posted : Thu Nov 8, 1988 8:28 PM

Name : LAS VEGAS ADAMLINK
Hrs/Baud : 24 HOURS 300 Baud 8N1
Phone : (702)/873-8056
Sysop : Harvey Seppala Lf-ON
Posted : Wed Jan 7, 1987 3:27 AM

Name : THE GAS STATION
Hrs/Baud : 24HRS 1200/300 Baud
Phone : (817)/265-8938 PCP/LINK
Sysop : M. D. Henderson
Posted : Tue May 6, 1988 2:55 AM

Name : ADVENTURE LINE
Hrs/Baud : 24HRS 300 Baud
Phone : (313)/445-1313 PCP/LINK
PCP/SLink#: MIDET - 5987
Sysop : LEAVE E MAIL IF U NO
Posted : Tue May 6, 1988 9:55 AM

Name : INNER CIRCLE IN MIA
Hrs/Baud : 24HRS 1200/300 Baud
Phone : (305)/227-9643 PCP/LINK
Sysop : SHANE & KEITH
Posted : Fri Dec 6, 1988 4:56 PM

Name : MSB-BBS
Hrs/Baud : 24/300-2400
Phone : (602)/395-9726
Sysop : MICHAEL BENEDICT
Posted : Sun Jan 5, 1989 7:31 PM

Name : CORNICOPIA
Hrs/Baud : 24HRS, 2400/1200/300 Bd
Phone : (407)/645-4929
PCP/SLink#: N/A - 7096
Sysop : JAMES YOUNG
Posted : Sun Mar 3, 1991 6:23 PM

Name : ADAM STAR BBS
Hrs/Baud : 11P-9A MOUNTAIN 24/12/3
Phone : (406)/652-6641
PCP/SLink#: N/A
Sysop : BLUE MAX
Posted : Sat Dec 9, 1989 3:37 AM

Name : VOICE of the EAGLE (A)
Hrs/Baud : 9P-6A DAILY
Phone : (615)/431-9833
PCP/SLink#: N/A
Sysop : RICKI GERLACK
Posted : Sun Jun 3, 1990 6:23 PM

Name : MAINE ADAM BBS
Hrs/Baud : 6P-8A WKLY 12/300 BAUD
Phone : (207)/583-4923
PCP/SLink#: N/A
Sysop : BOB SERELIST
Posted : Sun Jun 3, 1990 6:23 PM

Name : MICRO INNOVATIONS
Hrs/Baud : M-F 6P-10P ONLY 3/12 B
Phone : (703)/264-3998
PCP/SLink#: DCWAS - 2262
Sysop : MARK GORDON
Posted : Sun Jun 3, 1990 6:23 PM

Name : LVAC BBS (8-M-2)
Hours : NIGHTS AND WEEKENDS
Phone : (702)/873-8056
Posted : Sat Mar 4, 1987 8:18 AM

Name : PLINK-COMPUTER CLUB
Hours : Call VOICE 800-524-0100
for info on how to join
Phone : TELENET/TYMNET lines
Posted : Wed Dec 3, 1987 8:33 PM

Name : POWDER KEG
Hours : 6PMFRI TO 6AM MON
Phone : 416-492-5756
Posted : Sat Aug 7, 1988 1:03 AM

Name : COMPUSERVE
Hours : 24 hours
Phone : (800)555-1212
Sysop : Rob Friedman
: Call the above number
: for more information on
: how to join this great
: servce (the ADAM has its
: own computer club here)!

Name : MACH 1 BBS
Hours : 9:00PM TO 6:00AM CE
Phone : 414-762-0492
Posted : Fri May 2, 1989 6:57 PM

Name : ROCKY MOUNTAIN BBS
Hours : 24 (MST)
Phone : (719)783-9046
Posted : Thu May 3, 1990 1:37 AM

Name : THOMAS ELECTRONICS
Hours : 24 HOURS 7 DAYS A WEEK
Phone : (306)384-7682
Posted : Mon Aug 3, 1990 2:13 PM

Name : THE IRAUG BBS
Hours : 4P-6A M-F 24hr Weekends
Baud : 300/1200/2400 BAUD 81N
Phone : (714)775-1603
Posted : Thu Sep 6, 1990 8:15 AM

NOTE: The above BBS list courtesy of the A-NET systems. As Bulletin Boards are notorious for going out of business without much notice, please call voice to verify before dialing.

By Bart Lynch

CP/M FOR THE NEW ADAM USER

by Tom Keene

There is a fairly large group of ADAM users who need a little help understanding CP/M. They keep reading about all of these wonderful things that CP/M can do for them but they are at a total loss when it comes to using it.

First of all, what is CP/M, REALLY?

OPERATING SYSTEMS

The symbols CP/M themselves stand for Control Program (/=for) Microprocessors. The Coleco manual says that it stands for Control Program Monitor. Other references say it stands for Control Program Microcomputers, but Digital Research says that the M stands for Microprocessor. (Ah well, confusion over trivial matters still reigns!)

In short, CP/M is computer "operating system".

Just think of an "operating system" as a series of small programs that you can load into your ADAM; programs that can tell it how to do the usual things you expect your computer to do. These are things like storing information on your data pack or disc, or placing a display on the TV or monitor screen.

You normally do this with the ADAM and its built-in "operating system", (or "peripheral control programs", if you want to use a more descriptive name).

This built-in ADAM operating system, (or group of "peripheral control programs"), which Coleco calls the EOS, is a good system, but not very much powerful software has been written to take advantage of the EOS. Most of what Coleco produced for the EOS is quite good, but they didn't produce very much software because of the short life of their support of ADAM. And because EOS is unique to ADAM, little motivation exists for current professional software writers to write software for it.

Well, when you put your ADAM under the control of CP/M you can do these same "peripheral control" functions that you can with the EOS, and a many more. For example, when you want to get a program that has been stored on a data pack or a disc, the CP/M control system does that about the same way as the EOS does. The commands are worded a little differently, but in no way are they more complicated. Generally they are more simple.

WHY A NEW OPERATING SYSTEM?

Well if that's the main function of CP/M, what's the big deal? If we have an operating system that seems to work pretty well, why come up with a totally new system to do the same thing?

If we were the "only kids on the block", there wouldn't be much point in having another operating system. The one we have is really very good, ---better, by far, than those had by most other computers that were around when the ADAM was introduced.

MANY COMPUTERS, MANY OPERATING SYSTEMS

These dozen or more computers, like the ADAM, all had unique operating systems. The big problem was that none of these control programs would work with any computer other than the one for which they were designed. The MORROW was a great computer and so was the OSBORNE as was the KAYPRO. But if I had a document written on an early KAYPRO stored on a disk, I couldn't give it to someone who had an OSBORNE for use thereon. There was an appalling lack of compatibility existing among the many computers then in use.

It was like the biblical tower of Babel. Everybody could talk but nobody understood anybody else.

(ADAM even went the distance and put a built in word processor on a ROM chip. It was a good one, too. But you still couldn't share the disk output from SMARTWRITER with a MORROW user.

Almost all computers could do about the same kinds of operations. For example they could all be programmed to do word processing, but, as mentioned above, a word processing program written for a COMMODORE 64 could not be read on a FRANKLIN, or any other computer.

And just about every computer had some sort of spread sheet accounting program. Not all of them were terrific. Coleco

just happened to bring out one of the best ones in its ADAMCALC, but only ADAM users could use it or share its media output.

Look at all of those special programs that Coleco developed; programs like XperType, RECIPE FILER, FLASH CARD MAKER, TELLY TURTLE, SIMPLE CALC, SMARTFILER, WACKY WORD GAMES, BRAIN STRAINERS and dozens more. Others like COMMODORE had ten times as many programs as ADAM. But none of us could use the programs that were made for a different computer, no matter how much we wished that we could.

FIND A NEED AND FILL IT, ENTER CP/M

And this is where Digital Research came in. They developed an operating system called CP/M. It wasn't a program for any one computer, but was "universal" in that it was adaptable to every computer on the market.

Their idea was to create an operating system that would have only one unique section to it; and the design of that unique section was tailored to the particular computer for which that particular CP/M was designed. Thus it was that there was a CP/M design made to drive the peripherals of the Kaypro, another CP/M design to drive the peripherals of the ADAM, and so forth.

The CP/M version numbers used by Digital Research reflected both the update of the CP/M as well as the microprocessor that was involved. For example, the Kaypro and the ADAM both have Z80 micro-processor, so the newest version of CP/M that they were given was "Kaypro CP/M 2.2", and ADAM CP/M 2.2" respectively.

And since the CP/M operating system would allow software writers to address the CP/M system directly when wanting to operate a drive or call up a monitor display, (instead of having to write separate programs themselves for every function, (as was necessary prior to the advent of CP/M)), programs that were designed to work on Kaypro CP/M 2.2 would also work on ADAM CP/M 2.2.

This was not actually such a tall order as it might have been, because most of the computers were using either the Zilog Z80 or the Intel 8080 CPU chip. There were not many chips available, much as it is now.

And for the greater part most computers were providing the same functions as one another.

For example, the input of data for all normal computers came from either a keyboard or a punched tape, (and by the time of ADAM, from tape and disk drives). They all had output devices, such as the monitor screen, or a printer; and some kind of mass storage device like a disk drive or a magnetic or punched tape.

ONLY ONE PART OF CP/M IS UNIQUE

So CP/M was created to provide several distinct operations, only one section of which operating sections needed to be uniquely tailored for the specific computer. The unique section was a sort of traffic director for the commands it received.

The part of CP/M that Digital Research set up for this "traffic director" function, (unique to each computer), was named the Basic Input Output Section, or "BIOS" for short.

As mentioned above, this BIOS is unique in every version of CP/M. If a command is received to direct the output to a printer, then the BIOS sends the data to the appropriate port connected to the printer. (Only by small chance might that port be the same in two different computers, but CP/M shields the software writer from having to even consider that factor. He merely address his instructions to the appropriate CP/M routine, and CP/M takes care of the rest).

All of the other operating sections of CP/M were the same for all computers, greatly simplifyingthe work of the programmer.

Whenever a computer manufacturer decided to have CP/M configured for his machine, there certainly had to be a lot of collaboration between the manufacturer and Digital Research in order to create the BIOS.

BETTER AND MORE POWERFUL PROGRAMS

From the viewpoint of the programmer, a CP/M command to save a file to disc, must be the same no matter what computer is being used; (even though in actuality the routing of that command is different in every computer, via the uniqueness of the BIOS). CP/M sends the request to the BIOS and it will direct the data to the disc drive port according to the unique requirements of the computer and its peripheral.

And so with the presentation of CP/M to the computer world, the work of the programmer was greatly simplified, and a programmer could write programs that were readily interchangeable from computer to computer. This meant more royalty money for programmers for less work; and that in turn meant bigger and better programs for us because the programmers were more highly motivated to create than they had ever been motivated before.

AND BETTER DESIGNS FOR MASS DATA STORAGE

One might ask himself, "where does data fit on the disk?", that is "What is the arrangement of data storage as to the sector and track?", information that differs from computer to computer."

Well unless we are responsible for designing a new version of CP/M, you and I don't really care how it does all of this; just so it gets stored and just so we can get it back when we want it.

But Digital Research had a few new ideas on ways to do this, particularly in respect to the media directory . The CP/M management of files on disk, (or data pack) is beautifully efficient. For example, if you delete a file in CP/M, that deleted file space is immediately available to your computer for storage of new data.

[In the ADAM EOS a deleted file merely makes it inaccessible to the user. It generally still takes up room on the disc, and sometimes even on the directory.

Worse yet, the ADAM EOS counts the blocks remaining according to only the active files in the directory. Thus it might tell you that you have 100 blocks remaining when in truth you have none. In the CP/M disk management, the directory display is WYSIWYG, (what you see is what you get)].

THE MANUAL, A FIASCO!

It is unfortunate that Digital Research has never published a manual on their techniques of file management (or anything else having to do with the workings of CP/M). Some of this information is extremely hard to find.

There are several very good books on using CP/M. One of them is NOT the manual that came with your ADAM CP/M 2.2. This manual reminds me of Japanese operating manuals for VCRs etc. They should have given the manual to a user to see how much he understood before printing it. Then it should have been rewritten so that it is easier to understand.

I personally think that the confusion generated by the ADAM CP/M manual is the main reason that so many ADAM users have negative feelings about CP/M. Once you get the hang of CP/M, you will find that it is extremely easy to use. And T-DOS is even better, but there will be more on that later and in another chapter.

CP/M ORGANIZATION

BASIC DISK OPERATING SYSTEM, BDOS

As mentioned above, CP/M was divided into four sections. So far, only the BIOS (Basic Input Output Section), has been mentioned. The other sections are the Basic Disc Operating System (BDOS for short); the Transient Program Area (TPA for short) and the Console Command Processor (CCP for short).

These are very formidable sounding names, but please don't be intimidated. Learning CP/M is so very worthwhile that every moment you take to become familiar with it will repay you a thousand-fold.

Let us take a brief look at the function of these other sections of CP/M. The Basic Disc Operating System, (BDOS), performs many operations; and all are associated with the disc or data pack. These are listed in the ADAM CP/M manual, but I will summarize them here:

Disc or datapack system reset
Drive selection
File creation
File close
Directory search
File delete
File rename
Random or sequential read
Random or sequential write
Interrogate available discs or data packs
Interrogate selected discs or data packs
Set the DMA address
Set or reset file indicators.

The CP/M system, as you can see from its structure, is sort of large. Since it is not an integral part of the ADAM computer, (very few computers have CP/M as a built-in system), it resides on either a data pack or a disc. You have to load it into the ADAM memory space from the media.

To give you some idea of the size of CP/M, a disc that has the CP/M system tracks, reserves the first 15 blocks of the disc for the system. That is 15 Kilobytes of space. So a 5.25 inch floppy disk, which can store 160 Kilobytes of data, really has only 145 Kb available for file storage. The first 15 reserved tracks are used as follows:
-Block 0 is the boot block by which the ADAM EOS loads the CP/M into memory; therebye replacing itself as the operating system.
-Blocks 1 thru 12 are the actual CP/M operating system
-Blocks 13 and 14 are the directory blocks.

To get the CP/M from the media and into the ADAM memory, you

just insert the media, and pull the reset switch. As soon as you do this, you can see the disk operating light come on, or hear the tape spin.

After loading, a new BOOT function is located at the base of the random access memory at 0000H. (H designates hexadecimal). Now the BOOT contains machine code which will perform a warm boot. A warm boot loads and initializes the programs and variables necessary to return control to the Command Control Processor, (CCP); soon to be discussed.

There are two ways to boot CP/M. The first is the "cold" boot that we used to start up CP/M from a media. The cold boot is done with the reset switch.

But there are situations in running CP/M when you want to restart but don't want to do a cold boot. This is done with a "warm" boot.

The Cold BOOT

When you turn on the computer, it will just sit there waiting for instructions. Before a computer can do anything it must have a program stored in memory. (With the ADAM it self-loads the electronic typwriter program which resides on a special memory chip in the ADAM).

But as I pointed out above, CP/M is an alien system and doesn't reside in the ADAM. It must be put into memory, (generally referred to as "RAM". *But we have no command to do this since there is no program in memory to respond to a command.* (Unlike the CP/M operating system, EOS, the ADAM resident operating system, does not read and interpret the keyboard until another program orders it to do so).

However, EOS does have a routine to read the block 0 of a media into RAM, and then to cause the microprocessor to jump directly to the location in RAM to which it was loaded, and begin operating on the instructions that it finds there.

Located in block 0 of the CP/M media is the above mentioned COLD BOOT program. This program is very short, and simply tells the microprocessor which blocks of the media to load into which part of ADAM RAM; and then causes the microprocessor to begin operating on the CP/M routines as required.

This routine is called a "BootStrap" routine, (because it is analagous to "picking one's self up by his boot straps"); and the process of initiating it is called the "BOOT" process.

The COLD BOOT is a software function, but is initiated by a hardware function. If this all seems very complex at this juncture, let me explain that pulling the reset switch, is the "hardware function", and that this automatically begins the EOS "software function". (Now that wasn't too difficult, was it?)

And now CP/M does reside in memory, having replaced the EOS. From now on, as long as CP/M does reside in memory, there is a program in memory that will respond to a boot command, and that is located at memory location 0000H. Anytime we perform a software (or warm) boot, CP/M goes to the memory location 0000H for BOOT instructions.

The command for a warm boot is CONTROL-C. No matter where you are in the execution of a program, you can interrupt and reboot with a CONTROL-C. This will, of course, abort all operations in progress. It is useful if you get into an operation that is going nowhere, or one that will take a long time to complete and you are satisfied with what the program in operation has provided.

For example, suppose you are displaying a very long document and it will be scrolling up the screen for the next ten minutes. You have seen all you want; so to stop the action and return to the CP/M prompt, you just do a warm boot with CONTROL-C.

(This is a very handy feature indeed, and although in the EOS operating system there is also a boot initiating routine, it is not available to the user through a keypress).

I should explain what is meant by "CP/M prompt". When you cold boot or warm boot CP/M, the CP/M system is loaded into the ADAM and made ready for you to use. When it is ready for your use, a "A" appears. ("A" indicates that drive "A" is presently considered by the CP/M as the active drive. This can be changed at will). The appearance of this symbol means that CP/M is now awaiting your command.

In CP/M, a warm boot must be performed every time you change a disk. If you haven't performed a warm boot and you attempt to write a program to a disk which has just been put into the disk drive, you will get a BDOS error diagnostic.

(CP/M needs to know that a disk change has been made so that it can know what the directory assignments are on that new disk. There are a number of directory programs that will read the directory tracks and tell you some vital information abut the stored files. But if you have failed to perform a warm boot, the directories may contain erroneous data. Actually the ADAM gives a clue as to the fact that a media has been changed so that this "warm boot" step is not really necesnary. The new replacement for CP/M, "T-DOS" takes advantage of many of these special ADAM unique features).

THE TRANSIENT PROGRAM AREA, OR "TPA"

Now that CP/M is loaded into memory, your system parameters are located from the start of the warm BOOT (at 0000H) to

0100H, which is the start of the Transient Program Area (TPA).

The TPArea, or simply "TPA", is reserved for the processing of CP/M programs. This is where the actual user program, (not the CP/M operating system), that you are using is located. If you are typing with a word processing program, this is where the action is.

The size of the TPA varies from one type of computer to another, and even varies in the ADAM, depending upon the configuration you are using. Normally, and this applies to 99% of us, the TPA size is 49,920 Bytes.

Tony Morehen has written a very superior replacement for CP/M called T-DOS which increases the TPA. However, it needs to have an 80 Column device installed in order to achieve this enhanced TPA. (For Real Computing Power, Don't Fail To See The Chapter on T-DOS in this ASG).

A lot of other older computers have smaller TPAs. When CP/M was first introduced in 1975, TPAs were limited to 16K. The ADAM TPA is adequate for about 95% of all CP/M programs available. But there are a few that are too big to fit in the 49K TPA. Not to worry, you will rarely find a program too large for ADAM's TPA.

THE CONSOLE COMMAND PROCESSOR, OR "CCP"

Lying higher in ADAM's CP/M memory organization, just above the TPA is the Console Command Processor (CCP). In the standard ADAM CP/M the CCP starts at memory location C400H (50176 Decimal).

This is the part of CP/M that reads your console, (or keyboard), input; and processes the commands it receives. It is primarily a symbolic interface between the console and the rest of the CP/M system.

Depending upon the command given from the console, the CCP
1.sends and receives information to and from the Basic Disk Operating System (BDOS), or
2.sends and receives information from the Basic Input Output System (BIOS).
3.sends information it receives from the console and to the terminal.

This is the nerve center of CP/M but it requires only 2K of the memory. It occupies RAM from C400H to CC06H where the Basic Disc Operating System (BDOS) begins.

BASIC INPUT OUTPUT SYSTEM, "BIOS"

Quite often CP/M literature will refer to the "start of the BDOS" as the "start of Functional Disc Operating System" (FDOS). The "FDOS" is a combination of the BDOS and the BIOS.

There is no specially designated memory location for the BIOS. This statement is not meant to imply that specific functions of the BDOS and BIOS are just anywhere in the FDOS.

The cold start and warm start routines are located at very specific addresses; as are the console input routine, the console out routines, the select disk routine, the set track routine, the read disk routine, the write disk routine and on and on. Each of these has a very specific location.

This should give you a sort of rough idea of the general layout of the CP/M system. The ADAM EOS system is self contained in a ROM chip. The CP/M program must be loaded from an outside source; a disk or tape.

However, once loaded, the CP/M replaces the EOS, and will give the user command control directly from its own routines; while EOS depends entirely upon other programs to give control to the user. Thus it is then that EOS must switch directly to the wordprocessor after ADAM is turned on, unless another "BOOTable" program is present in an active drive immediately after EOS is transferred from its ROM to ADAM RAM: and CP/M presents its own prompt, and awaits command.

MORE INFORMATION AVAILABLE

I would like to give you a short bibliography, beginning with the best one I have ever seen for introduction to CP/M:

USING CP/M (a self teaching Guide)
By Judi N Fernandez and Ruth Ashley
Published by John Wiley & Sons, Inc.

A terrific training course is put out by HEATH/ZENITH. Though expensive, you can get college credit if you complete the tests that are part of the course. It uses a combination of written text and a large number of audio cassettes, and is extremely well presented! Though possibly not listed in the current catalog, it should still be available, and is called:

An Individual Learning Course in CP/M
Model HC-1120.

A fairly advanced book on CP/M is:

The CP/M Handbook (with MP/M)
by Rodney Zaks
Published by SYBEX

My *favorite* book on CP/M is:

OSBORNE CP/M USER GUIDE
by Thom Hogan
Published by Osborne/McGraw-Hill

Thomas J. Keene

T-DOS - NEW POWER FOR ADAM - AND FREE!

by Ron Collins

INTRODUCTION

T-DOS was written by Tony Morehen for both the experienced ADAM computer user as well as for the ADAM newcomer, and makes the "ADAM" Family Computer System much more powerful and useful than it was even when it was new.

Those of you who have done little more than hook up your ADAM and use it to play games, write letters on SmartWRITER, or run AdamCALC, SmartFILER, etc.; will be able to run applications software to do things with the ADAM, that you never before thought possible.

With T-DOS you will find a new door has just opened up to you, a door that will perhaps give you reason to forget the very consideration of spending money on a "better" computer that can "do things the ADAM can't do".

The truth is, there is very little this ADAM can't do with T-DOS and the right CP/M software!

If you are one of the ADAM owners who would like more power from a computer, one who wants to get out of the limitations of the standard ADAM programs that come with the BASE ADAM, then READ ON!

Those of you with a fair to advanced background in the BASE ADAM computing, will be able to move right on into the more advanced capabilities of T-DOS. You will suddenly find your ADAM blessed with the proper support to get the most out of your new hardware, and you will find that the problems which have become a part of your everyday computer use, (with programs like SmartWRITER for example), can now go away.

And for those of you who once tried CP/M but disliked its limitations, you will find that many of the more complex CP/M programs that used to require too much TPA to run them than CP/M 2.2 afforded, will now run with perfect ease with T-DOS.

With T-DOS fully installed on your ADAM, you will have the world of high power CP/M software at your door. Applications programs for CP/M exist in the thousands, and almost any of them will work with T-DOS on your ADAM.

There are Word Processors that support files a hundred times the size of SmartWriter's best efforts, and Spreadsheets that triple AdamCALC's maximum, (and without the "lock-ups" and "bugs"); while creating data you can trade with other computer owners other than those who own the ADAM.

There is Database software; and there are utility and applications programs that allow you to do so many of those things that Coleco failed to provide.

You can still play the Coleco games you love, they are after all, among the best ever made. But when you're ready to quit "playing games" with the standard user "beginner software" that Coleco designed for computer "beginners", and start using your ADAM as a real computer, a powerful COMPUTER; you'll be ready to use T-DOS, the ADAM's only "state of the art" operating system!

IN THE BEGINNING

REPAIR BUGS, ADD FEATURES

When Tony Morehan first started working on T-DOS, his work was simply a set of extremely useful routines that fixed several bugs in standard CP/M.

But, while repairing the bugs, he also added many much-needed features.

In those early days the software that eventually grew to become TDOS, came in the form of a "patch" program called NEWCCP. When I used the "patch" on my CP/M, I found that all sorts of problems that I had previously encountered with CP/M, were suddenly gone, and I had a smoothly running, properly functioning "NEW CP/M"!

CP/M PROBLEMS

Among other CP/M problems, its support files such as PIP and COPY were shipped by Coleco with an inherent bug that made it nearly impossible to copy any files over 16K in size: and access to memory expanders larger than Coleco's original 64K memory expansion. And even access to disk drives larger than 160K were just not possible. Nor were any of the other presently available, (non-Coleco), peripherals for the ADAM able to be addressed by the original CP/M. It would not, for instance, write to any printer other than the ADAM printer.

"NEWCCP", virtually eliminated these bugs; while providing the user with the ability to customize the hardware support "on the fly". If you added to your system, you simply re-ran the NEWCCP.COM program to tell your newly modified version of "CP/M" about it, creating an even more newly modified version. From then on, your version of CP/M would allow access to the new hardware.

CHANGING THE FEATURES

Some of the program support files found in the original CP/M 2.2 package, such as COPY.COM; and directory support programs such as DIRR.COM and a few others, were eliminated from the directory by building them right into the new operating system. This "building in" of support utilities is what makes their operation so fast and so powerful. When using the "built in" utilities there is no longer any "wait" for programs to load from an external device like a disk drive for example, there is only an internal routine which is activated instantaneoulsy.

"Building in" such routines allows more features to be added as well, because they are written in machine language rather than some interpreter program language like BASIC. This makes the routines extremely compact and best of all, very FAST!

Tony also chose an additional set of routines with a lot of new features, and built them into NEWCCP as well.

THE CREATION OF T-DOS!

Over the past three years or so, this series of changes has evolved into a much-streamlined and feature-packed replacement for CP/M, which Tony appropriately named "T-DOS".

RIVAL OF MS-DOS

The current version of T-DOS, is far more sophisticated than just about any other computer's implementation of CP/M. And the simple command structure of T-DOS is so easy to learn that most people pick it up in a matter of hours. This latest version gives the ADAM "near MS-DOS" style features and command structure.

One thing that many computer users have forgotten over the years, is that the much vaunted MS-DOS is only a modified version of CP/M. Even in it's current form, MS-DOS is still in full possession of the bugs from those earlier versions of CP/M from which it was copied.

NOT SO T-DOS

In T-DOS those bugs have been squashed flat. All of what MS-DOS wishes it were, T-DOS has become!

WELCOME SEEKERS OF POWER

This article was written to introduce T-DOS to those who are only now looking for the ability to make ADAM really work for them. Of necesssity then, they must abandon the ADAM BOS operating system!

They need a more advanced operating system than either BOS or CP/M. That system is T-DOS!

I will try to explain the different terms and options in a way that you can understand. The information presented can in no way compare to what you will learn simply by using T-DOS. After three years of working with various revisions of the software, I am convinced that this version is the best operating system I've ever used.

If I do nothing else in writing this article, I hope that I will be able to peak your curiosity enough so you will want to at least LOOK at T-DOS. There are few software packages that come close to this one and even less that come to you absolutely free!

T-DOS FOR NEWCOMERS (What is T-DOS)

T-DOS is an alternative operating system for the Coleco ADAM that is 99% compatible with Digital Research's CP/M 2.2 program as supplied by Coleco in ADAM format. (And, since you asked, the name "CP/M" stands for Control Program Monitor).

T-DOS emulates a great deal of what CP/M does best: that is, it helps your ADAM communicate with all of it's different peripherals and other parts. T-DOS just helps MORE of the parts keep in touch with the central control, and allows the use of them to greater advantage.

What all of this means is that your light beige box can now run a whole new and powerful series of programs that can turn it into an efficient and powerful home computer that will run rings around almost all other "8-bit" machines.

This new operating system will provide you with more capabilities and features than the BOS or standard CP/M systems.

T-DOS, WHAT IT DOES

In the pages that follow, I'll try to explain the different features and their purposes. I will as well, try to describe the various facets of the operating system in general. Even more information is provided in the manuals found on the T-DOS disk or data pack.

"Talking to" T-DOS and working with it are all done by way of three different types of commands.

RESIDENT, TRANSIENT AND KEYBOARD COMMANDS

BUILT-IN OR RESIDENT COMMANDS

The first type of commands are built into T-DOS and are known as the RESIDENT or BUILT-IN commands. These "reside" in RAM as a part of the T-DOS program itself.

An example of a resident command, is the "CLS" routine. Just type "CLS" and press "RETURN", and watch as T-DOS clears your screen and places your cursor and the prompt into the upper left hand corner of the screen.

The routines for performing these kinds of tasks are not listed in the directory display when it is called up, because they reside not on the media as separate files; but in RAM, being a part of the overall T-DOS program.

TRANSIENT COMMANDS

The 2nd method of talking to T-DOS is via the program support files. The T-DOS software comes with several T-DOS specific support file programs and many more are available. These commands are known as "TRANSIENT" commands because the routines these commands initiate don't reside in RAM with the T-DOS proper. Rather they reside on the media, and are loaded to RAM whenever they are requested.

Transients are files with a filetype of COM, and can be executed by simply typing in their name, and pressing "RETURN". It is not necessary to type in the ".COM" with T-DOS as it was with CP/M.

The program to format a disk or datapack is just such a transient routine or program. It is found on the disk as FORMAT.COM To run the program, all you need to do is type in the command "FORMAT", and press the RETURN key. (And an added simplicty is that there is no requirement to separate upper and lower case letters when you type in the command. T-DOS knows that to "format" is the same as to "FORMAT", which is the same as FoRmAt. That makes it very simple for the user).

KEYBOARD COMMANDS

A third type of commands recognized by T-DOS, are KEYBOARD commands. These commands are carried out when certain key presses or keypress combinations are pressed. T-DOS will always look for these combinations and then carry out the task each one designates. An example of such a keyboard command would be the use of the UP-ARROW key to move the cursor up one line.

T-DOS COMMAND STRUCTURE

As I mentioned above, T-DOS has three different types of commands upon which it can act.

The first type recognized are called "RESIDENT" or "BUILT-IN COMMANDS". These are commands similar to those you worked with in SmartBASIC to get a directory display by typing in "catalog", or "run" to run a program, "save" to save a file, etc.

You did not have a special program called CATALOG.BAS on your disk that you would have to run to get a catalog of that disk did you? Of course not! That's because the routine to read the directory from your disk or data pack was BUILT-INto SmartBASIC.

Features of this type are also called RESIDENT COMMANDS because they RESIDE in memory just watching and waiting for you to call on them.

RESIDENT OR BUILT IN COMMANDS

Unlike the ADAM's intrinsic operating system, (EOS); CP/M and T-DOS have a few "built-in" commands that they can carry out immediately after being loaded, without the need for a separate program.

By way of contrast, in the case of the EOS operating system, there are no "built in" commands in EOS that are directly available to the user immediately after EOS is loaded. Therefore all access to EOS routines must be made via an auxiliary program (like SmartBASIC, SmartWRITER, etc.); an auxiliary program that must be loaded subsequent to the loading of EOS.

On its own, on "power on", EOS immediately loads the SmartWRITER program from an internal ROM, (just in case that is your desired program, as it often is for many of you). If SmartWRITER is not your desired program, then you must load a media, (containing what you want booted), to a drive; and pull the "COMPUTER RESET" switch to load it.

On the contrary however, if T-DOS were the intrinsic ADAM operating system that went into effect immediately after ADAM was turned on as is presently the case with EOS; the T-DOS "built in" commands would be immediately available to the user.

As it is presently however, the EOS routines that are loaded to ADAM RAM when the power switch is turned on, are used to load T-DOS from a media, (by putting the T-DOS media into a drive and pulling the "COMPUTER RESET" switch as explained above); and then TDOS is loaded into RAM, replacing EOS as the ADAM operating system. The "built in" commands are then directly available to the user, without the requirement for loading an auxiliary program.

For example, in order to get a directory display of a disk or data pack using T-DOS, all you need to do is;

1.select the drive, (if not already shown to the left of the prompt); and then

2.type "DIR" (short for directory), (or press the appropriate SmartKEY to do it for you), and then

3.press return. The display will appear.

(To accomplish the same task of obtaining a directory display of an EOS formatted media and using the EOS routines, you must; 1.boot an auxiliary program which has routines that supply certain required input parameters to the EOS directory routines.

2.use that auxiliary routine to make the directory display CALL, usually by;

3.selecting the drive,

4.typing in the command and

5.pressing return. The display will appear).

Unlike the SmartBASIC "CATALOG" command, the CP/M "DIR" command does not show you the sizes of the files listed in the directory display.

T-DOS fixed this limitation by causing a screen display to appear that tells you exactly how much space the disk can hold when empty, how much space each file has used, how much space has been used so far (by totaling up all the space used in all of the files), and finally how much space remains.

T-DOS' CUSTOMIZED DIRECTORY DISPLAYS

Inasmuch as I am presently discussing the directory display, perhaps this would be a fitting place to explain how T-DOS installation procedures address the problem of making T-DOS video displays fit the various displays presently in use by ADAM users.

T-DOS is "stylized" into any one of several styles depending upon what peripheral equipment you will use with it. The transient programs 40TDOS45.COM and 80TDOS45.COM are provided for you to use to custom install your own personal style of T-DOS. These programs are provided with T-DOS for your use, and are referred to herein as the "install" programs.

If your display system is a TV or monitor without the 80 column capability, you will be using 40TDOS45.COM to do the installation of T-DOS for your system. T-DOS will then come up on a 40 column screen display.

If you have an 80 column video unit or an 80 column "dumb terminal" connected to your ADAM, you would then use 80TDOS45.COM to customize your T-DOS display for an 80 column screen.

Among the several possible styles that can be created with these installation programs, there are even styles of T-DOS for owners of the PowerMATE hard drive system and/or serial ports. The installation programs can make T-DOS styles that work with no hard drive, OR with the OBS/Mini-Winnie hard disk system. Any presently available ADAM system is supported by a style of T-DOS.

The hardware that the "install program" reads as "being connected", (as the "install program" is runing); is what determines the type of hardware that is supported when you later boot the disk or datapack.

When installing, you will pick your display type by selecting the proper xxTDOS45.COM for your system. As a result, your directory will always be just the right size for your screen.

Gone are the days of "scrolling around" to find the rest of your directory! Another CP/M problem is herewith eliminated!

Now 40TDOS45.COM gives you a 40 column directory and puts it onto your screen in a full 40 column format. (SmartBASIC and the earlier ADAM CP/M 2.2 only provided 32 columns on a full screen).

And 80TDOS45.COM gives you an 80 column directory and puts it onto your screen in a full 80 column format.

Because of a "full support" program of an installed clock, T-DOS will even "time and date stamp" your files, and the two directory programs supplied will let you get a directory that shows these date stamps along with file size and space available information. (For now, T-DOS recognizes the RVE SS-CC and the Orphanware clocks but even if you have no clock, date stamps will still be supported by use of the included DATE12.COM utility program).

THE FOLLOWING IS A FULL LIST
OF THE RESIDENT, ("BUILT-IN") COMMANDS

DIR - A sorted directory listing that provides file size and disk usage information.

COPY - Copies files from one disk to another. Wild cards are permitted for multiple file copying.

TYPE - Displays files on the "CON: device", (usually the screen or monitor). Supports end of screen pause for easy file viewing.

LIST - Displays files on the "CON: device", and also sends them to the "LST: device", (usually the printer).

REN - Renames a file.

SAVE - Saves data in memory to disk as a file.

DEL - Erases or Deletes files.

CLS - Clears the screen.

GO - Restarts last program loaded into memory.

TRANSIENT COMMANDS

The second type of commands with which TDOS works, the "TRANSIENT COMMANDS", are represented on the T-DOS media in the form of some very outstanding support utilities.

Any number of commercial or public domain applications programs would also fit into this type of category. The famous commercial programs as dBASE II and WORDSTAR come to mind and run perfectly well on an ADAM. (See the Elliam Associates dealer ad in this ASG, and the chapter ADAM DEALERS AND SUPPLIERS, and chapters on TELECOMMUNICATIONS AND BBS'S, and SOFTWARE FOR T-DOS AND CP/M, for more information on commercial and public domain T-DOS and CP/M programs)

The utilities provided with your copy of T-DOS are:

PROGRAM	DESCRIPTION
CD74	(Change Dir)= CD can be followed by directory name
CU15	(Change User)= CU followed by files and destination
DATE12	(View/set time and date) Cao read OBS/EVE clock.
DRIVES12	(View the drives and their sizes connected to ADAM.)
DSIZ24	(Temporarily change the selected drive's size.)
FC05	(Allows transfers of files between EOS and T-DOS.)
FF27	(Find a file anywhere on your system)
FORMAT34	(Creates a program called FORMAT.COM with your OS.)
FORMAT	(Formats media and installs your version of T-DOS.)
INITDR12	(Initialize a directory for date stamps).
IOBYT12	(Change the default periferals temporarily.)
PATH13	(Change the default path/View/Alter current path.)
MOUNT11	(Use with larger drives to swap drive partitions.)
SORTDR10	(Sort the directory on any drive)= Must specify drive.
TDIR1-14	(View directory with create and modify date stamps.)
TDIR2-14	(View directory in 2 columns with date stamps.)
UNDEL12	(Undelete or restore erased files)= UN with filenames.

As you can see from the list, TRANSIENT COMMANDS are really just like the "built-in" program utilities we learned about earlier, except for the fact that these utilities aren't "built-in" to the operating system. They are "stand alone" programs that reside on the media, that need the operating system, (T-DOS), before they can be used; (just as SmartBASIC needs the EOS before it can print to the monitor, or your HELLO program needs SmartBASIC before it will execute).

And just as your HELLO program needs SmartBASIC before it can be run, your TRANSIENT COMMANDS need T-DOS.

We call these little utility programs, "commands", because, like the built-in commands, (DIR in the example given above); they only require you to type in the part of the filename preceding the ".", in order to run them.

KEYBOARD COMMANDS

The third type of the three T-DOS commands mentioned above, are the "KEYBOARD COMMANDS". These commaods allow some real flexibility and command line edit possibilities.

The keyboard commands fall into two categories, the "USER DEFINED COMMANDS" and the "SYSTEM DEFINED COMMANDS".

The first type includes those such as your SmartKEY strings. These SmartKEY strings can be changed by way of the "built in" "submit" function of T-DOS, to do any number of things when pressed.

When you are in the process of installing T-DOS on your ADAM, you will be asked if you would like to "EDIT SMARTKEY STRINGS?".

If you want to; say for example, have your ADAM run the DATE12.COM program whenever you are in T-DOS and you press SmartKEY I; then you would answer "Y" to the "EDIT SMARTKEY STRINGS" question.

As you would go through the edit process you would be asked which keypress to use; the name of the routine to be executed, (which will subsequently appear behind the prompt whenever the SmartKEYI is pressed, the "return string"); and what text you wanted to appear on bottom of the screen to help you remember the function to be performed.

Continuing with this example, the keypress you would want is SmartKEY I, the name of the routine would be "DATE12.COM"; the text to appear after the cursor, (the return string), would be "DATE12"; and the text you wanted at the bottom of the screen might be "DAT", (you make his one up yourself).

After installation of the T-DOS with this edit routine being performed; forever thereafter, whenever T-DOS was loaded, the specified text "DAT" would appear in the SmartKEYI box at the bottom of the screen. When that key was pressed, the phrase "DATE12" would appear at the cursor, and the cursor would move to the end of the phrase. Upon a press of the "RETURN" key, the program DATE12.COM would be loaded by T-DOS, and would then execute.

SYSTEM DEFINED COMMANDS, (another type of keyboard command), are those that T-DOS has built into its own programming. When one of the special keys or special key-combinations is pressed, TDOS knows that it is being "commanded" to run a particular routine.

For instance, pressing the key-combination "^P", (your "CONTROL" key pressed while depressing the "P" or "p" key), will tell TDOS to run the routine to print whatever it sees on the video screen.

Printing out the directory of your disk or data pack onto paper using your dot matrix or SmartWriter printer is simple using this special keyboard key. (Since the "^P" command causes the screen to be printed; the command "^P", to run the printer must FOLLOW the command to show the directory.

As you can see then, (as mentioned above), SYSTEM COMMANDS are really another form of KEYBOARD COMMANDS, and they will be referred to as such from this point on.

T-DOS has also improved editing for the line input function.

All programs that require the line input function, (the actual command being typed in by the user, to actually RUN the program, etc., including the CCP's command line input which will be explained); now have the following editing capabilities. Take particular note of the ability of T-DOS to recall previous line inputs.

^S or left arrow	- move the cursor to the left in the command line. This cursor movement is non-destructive, no text erased.
^D or right arrow	- move the cursor to the right, non-destructively.
^H or backspace	- delete the character to the left of the cursor.
^G or delete	- delete the character under the cursor.
^E or up arrow	- recall previous line input. The BDOS saves up to 30 previous command lines for recall and editing.
^I or down arrow	- recall next command line.
^V or insert	- toggle insert/type-over mode. When RETURN key is pressed, type-over is automatically selected.
ESC	- clear the command line.
^C	- will warm boot the computer.
^P or print	- toggles printer dump. Use at end of command line. Note: stop print dump before using DIR.
SHIFT+UNDO	- will turn the SmartKeys on or off when using 40TDOS(nn).
SHIFT+TAB	- will uppercase all letters. Numbers and punctuation marks remain unchanged
SHIFT+WILDCARD	- will park the heads on your hard drive (provided you have one connected.)
LOCK	- will uppercase all keyboard characters
BACKSPACE	- will backspace your cursor one place.

HARDARE ADD-ONS AND T-DOS

With all of this support, T-DOS can handle any of the various ADAM hardware items now available.

It supports up to 4 Coleco or modified disk drives, two data drives, memory expanders of up to 1 megabyte, the SmartWriter printer, a parallel printer interface with its dot matrix printer, the AdamLINK modem, any of several available serial interfaces, external modems up to 19,200 baud, two types of hard disk drives, all presently used 80 column video units, 80 column terminals, standard TV or monitor displays, a clock/calendar card and more.

IF YOU DO NOTHING ELSE WITH YOUR ADAM THIS YEAR, GET TDOS AND GIVE IT A TRY!

As explained above, T-DOS is only active when you boot it up. It is a temporary operating system, in place at your command!

It is a powerful operating system and it is the only one available that can access all of your ADAM hardware.

Then one asks, "With all of this added to the fact that T-DOS is free to all, why wouldn't everyone get it?"

Well, as it turns out, there has long been a sort of "shyness" among ADAM owners when they come into contact with CP/M.

I think this is because the terms used, and the program's presentation, are a good deal more on the technical side in approach than the ADAM owner has seen in his brush with SmartBASIC for example.

The syntax, (the method of "talking to" the operating system), is also different in many ways.

Many ADAM owners have become so accustomed to the "English statement" approach of SmartBASIC, (that of "typing in" programming lines in English, and letting the SmartBASIC language system translate it into the machine language that the Z80 microprocessor in the ADAM understands), that anything else seems impossible to follow. (This was particularly true of the relatively "very user unfriendly" CP/M)

But the previous use of SmartBASIC by you as an ADAM user, may actually be an asset to you, as you are newly introduced to T-DOS. Programming in SmartBASIC at least did teach logical principles and program order, both of which are extremely useful, if not required, in any area of computing. In many ways, this is great background for anyone.

And now it is possible to move beyond the limitations of EOS, and use an operating system that has many more features and much more power than the ADAM EOS operating system provides.

I think Tony had SmartBASIC users in mind when he worked out a way for just about anyone to install T-DOS.

You may not have thought of this yet, (unless you have tried to address disk drive 2 from SmartWRITER, or print an ADAMCalc spread sheet to your dot matrix printer, for example); but Coleco did not have their "EOS-type" programs written to accomodate all of the newly developed and now available items which can be attached as peripheral items to the ADAM.

And since some ADAM users have some of these peripherals, some have all, and some have added none of them; it follows that not all users have exactly the same hardware installed on their ADAM. (Now that is logic if logic ever was!).

If T-DOS is to be available to any and all of these users, it must be adaptable to work on all ADAM systems. It must also be easy to install for all ADAM systems.

Tony, in his attempt to minimize the difficulty of installing the T-DOS for the various systems, must have used the following reasoning.

Most of you have some experience in using SmartBASIC.

And most of you know that many SmartBASIC programs are "MENU" driven, that is, on-screen menus direct the user to select a SmartKEY or to press some specific keyboard key to use the program.

You are already familiar with that idea, so Tony used this basic feature when designing his "T-DOS operating system installation" programs, 40TDOS45.COM, and 80TDOS45.COM.

T-DOS is usually distributed on disk or data-pack installed for a very basic ADAM system, BASE ADAM.

If you have already ordered it, and did so from some other source, it may have come already installed with the system you currently have.

Either way, the usual procedure is to "play it safe" and format a new disk or data-pack and construct your own custom TDOS that supports YOUR hardware.

To show how easy and "menu driven" a program xxTDOS45.COM really is, let's take a quick look at some of those menu screens as we practice an installation of T-DOS for my system. What follows is an actual representation of what came up when I ran 80TDOS45.COM. I used 80TDOS45.COM because I have 80 column display peripheral attachments.

(PLEASE NOTE: There is also a 40TDOS45.COM for the TV display when you don't have peripherals permitting 80 column display).

WHAT DRIVE HAS THE TARGET MEDIA?

The following screen is the first one to appear after booting T-DOS, and "typing in" behind the displayed prompt symbol: "80TDOS45" and pressing return. (The right side of the screen contains my notes for your convenience. The left side, left of the vertical lines, represents the screen as it actually appears).

```
T-DOS V 4.5 INSTALLATION PROGRAM
    Copyright AJH Software
(SCREEN PRESENTATION HERE) |    (MY OWN NOTES APPEAR HERE)
                           |
 INSTALL SYSTEM ON DRIVE   |
                           |You can install T-DOS on any one
  1 - Tape Drive 1         |of your Coleco disk or data pack
  2 - Tape Drive 2         |drives. This will make that one
  3 - Disk Drive 1         |self booting. If a hard disk is
  4 - Disk Drive 2         |connected to your ADAM, only the
                           |boot block will be written to an
 Enter Choice:             |disk/tape.
---------------------------|-------------------------------
```

(Remember, the left side of the above display is all that you will see on the screen)

Well, that's a pretty confusing screen isn't it? Of course not!

All that is required is that you press any number from 1-4, (selecting which drive it is in which you have placed the media upon which you wish to install your "custom styled" T-DOS system).

If you happen to own a hard disk system, the T-DOS will be written to the hard disk itself, and just a boot block will be written on the disk or tape to tell your ADAM where on the hard disk to look for the T-DOS program.

DO YOU WANT RAMDISK BEFORE OR AFTER OTHER DRIVES?

Next, TDOS will ask you if you want your RAMDISK, (memory expander, if you have one), to be installed before or after your disk and tape drives. I like to have my memory expander RAMDISK come between my hard disk and my disk/data drives. so I simply press a "B", ("B", for "B"fore). (The lightning fast use of that memory expander as another "disk drive" is the best reason for having a memory expander).

HARDWARE PRESENTATION

After the location preference has been given, T-DOS will scan your entire system, and a table of hardware will be presented:

```
T-DOS V4.5 INSTALLATION PROGRAM
   Copyright AJM Software

Your CP/M drives are as follows:

 A - Hard Drive Volume 1 |    (If you are using a 40 meg hard
 B - Hard Drive Volume 2 |==> disk or larger, you would see
 C - Hard Drive Volume 3 |    5 drive partitions.
 D - Hard Drive Volume 4 |
 E - Ram  Disk           |==> From 64K to Mega-ram supported
 F - Disk Drive 1        |
 G - Disk Drive 2        |==> 160K, 245K, 320K, 360K and 720K
 H - Disk Drive 3        |    drives are supported.  Up to 4.
 I - Tape Drive 1        |
 J - Tape Drive 2        |==> You still have your data drives
_________________________|_____________________________________
```

As you can see, T-DOS is telling me the order of my drives, and what drive letter it will assign to each. I need to write those down, if there are so many that I can't remember.

DRIVE SIZES

The next thing T-DOS will do is to ask me what size it should assign to each of my disk drives. (There is no simple internal method by which a program can determine the size of most drives available to the ADAM. The exception to this is that of the B&T disk drives).

Please notice, (below), that 6 different capacities are supported. The final capacity (number 6) is listed as being 714K in size. I will explain a bit about T-DOS and CP/M disks, which also holds true for DDPs.

.

The normal capacity of a 3.5" disk is 702K under T-DOS and 720K under EOS. The disk is fully used in both cases, even though it doesn't look like it when one compares these two sizes.

This is because a 12K section of each T-DOS, (or CP/M), disk is always reserved for the operating system. 1K is always reserved for the boot block on block 0, and at least 1 block is reserved for the directory. This totals 14 blocks, (at least), that are ordinarily reserved for system use.

If you keep this in mind, you will understand why the 160K disk drives are listed in the installation screen shown below, as 145K drive capacity. (With the convenience of having the operating system on the first few tracks, you won't need to run any special programs to get started. Just pull the RESET and off you go).

The sizes as they appear on the selection screen:

```
 T-DOS V 4.5 INSTALLATION PROGRAM
      Copyright AJM Software

MAX. SIZE OF ADAM DISK 1      |       DISK COMPATIBILITY
                              |
   1 - 145K (std. Coleco      |==> Standard Coleco 160K
             single-sided)    |    format
   2 - 254K (medium-sized     |==> Eve format/ can read
             double-sided)    |    160K or 254K disks.
   3 - 304K (full-sized       |
             double-sided)    |==> Orph'are/AJM 320K format
   4 - 356K (IBM-sized        |
             double-sided)    |==> Orph'are/AJM 360K format
   5 - 702K (quad density)    |==> Orph'are/AJM 720K format
                              |
   6 - 714K (quad density)    |==> Orph'are/AJM 720K format
                              |    DATA DISK ONLY! No system
 Enter Choice:                |
                              |==> All B&T drives also
______________________________|    supported_____________
```

The rest of the installation is just as simple to navigate!

A very easy-to-follow installation guide is also provided along with complete documentation for T-DOS and each of the utilities that support it. All are text files that you can read on your video screen, or just print out for a hardcopy. All of this can be found in files with your copy of T-DOS, whether on disk or data packs, when you receive T-DOS.

Because of the professional programs presently available, (and many other programs still being written for CP/M by many programmers of other CP/M 2.2 computers as well as for ADAM), T-DOS may well be the most important part of your ADAM's "SURVIVAL KIT OF THE 90'S"!

YOUR OWN OF T-DOS

To get a copy of T-DOS, please check out your local user's group library, or contact ADAM LINK of UTAH, ADAM'S HOUSE, MIAD, or any of the national vendor/user's groups. You can usually find T-DOS in the public domain libraries of these groups. (See front sections of this ASG for "IMPORTANT NAMES AND ADDRESSES").

An even faster way to get a copy of T-DOS would be to contact one of the many ADAM supporting BBS systems around the USA and CANADA.

T-DOS is also currently available in the CLUB forum on CompuSERVE and in the CP/M area of GEnie. On CompuSERVE, Rob Friedman is that area's SYSOP.

In fact, if you want a copy of T-DOS, you can write to Rob Friedman, (see IMPORTANT NAMES AND ADDRESSES in the front of this ASG), send him 2 clean, INITed Digital Data Packs and a stamped, addressed return envelope in which he can mail them back to you; and he will most graciously send you a copy for the BASE ADAM. It will have the necessary installment programs, and you can procede to install it immediately for your own system. Include just a note to tell him that you read in the ASG about the T-DOS GIV program that he is offering, and that you would like to take advantage of it.

Now isn't that simple enough? It is great to have so many ADAMites, like Rob, who are so eager to help all of us make more and better use of our great little ADAMs, and his service is greatly appreciated though not financially compensated. (And it never hurts to say thanks to these loyal ADAMites).

The setup will be for an ADAM with one data drive, no memory expander, no disk drives, and the ADAM SmartWriter Prioter. When you perform the installation on your own, T-DOS will scan your system and ask you the questions that will make it become a version that supports all the hardware on YOUR system.

T-DOS can also be found on the AMAUG BBS at (202)561-2475, the Micro Innovations BBS at (703)264-3904 and the ADAM EXCHANGE (my home BBS in the Cleveland, OH area) at (216)883-9355.

There are surely many more BBS's that support file transfers and carry copies of T-DOS, than just those I've mentioned. (See BBS list in chapter on "TELECOMMUNICATIONS AND BBS'S").

The main point to remember is:

T-DOS IS AVAILABLE NOW
AND
IT DELIVERS THE COMPUTER POWER YOU NEED NOW!!!
AND

IT IS FREE!!!!!!

T-DOS may well be the most important factor in the survival of the ADAM in the '90s, considering the alternative of getting more computer power from one of those overpriced 16 and 32 bit sytems!

I know far too many ADAM owners who decided that CP/M was an operating system they didn't want to try. "EOS is all we need!" they told me over and over.

A few years later, many of them ended up spending 2 to 3 thousand dollars for an IBM compatible system so that they could have access to some word processor program like "WordStar 4.0", or a database program, like "dBASE II".

They soon found that to do anything worth while on their new unit, a lot more money for some very expensive software was required than they would have otherwise spent with the ADAM TDOS and the good professional and public domain CP/M programs that are available for ADAM's T-DOS.

And when they investigated their new machine more thoroughly, they found that the "new operating system" that their "clone" used was a lot like that CP/M in the ADAM world from which they ran.

And they had already spent a small fortune just to have the privelege of finding that out!

Just mull over in your mind about how much money you can save by NOT moving to an expensive computer.

The powerful software for CP/M computers can do many of the same things.... sometimes even better; and for almost all of us, more things than we really will ever want to do!

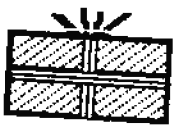
And these CP/M programs will run on your ADAM better under T-DOS, than they ever could under standard CP/M.

And this is often accomplished at a very reasonable cost, because, now that MS-DOS software is the money maker for software authors, a great number of the best CP/M program files have been released into the PUBLIC DOMAIN.

If you belong to a user's group such as ALU, MOAG, or MIAD; or if you have access to a modem and thereby have access to one of the better BBSs, (Bulletin Board Systems), you can get a large library of top quality software for next to nothing.

The point to keep in mind is that rather than being obsolete, you can make your ADAM a "state of the art" computer; at least as far as software is concerned!

Ronald W. Collins



SOFTWARE FOR T-DOS OR CP/M

CP/M FOR THE ADAM

PROGRAMS THAT FUEL THIS POWERHOUSE

by Tom Keene

AN OVERWHELMING ASSIGNMENT

There are so many superb CP/M programs that can be ran on the ADAM that it is impractical within the size limitations of this chapter of the ASG to list them all.

And it is almost as difficult a problem to organize them in some logical fashion.

It is nearly as hard to rank them on some sort of scale, and they are too diverse to compare.

One program may be a terrific spelling checker while another might be an outstanding data base program; yet another might be a superior modem program.

I am simply going to have to select a few of what I consider the best CP/M programs and discuss their value and application.

I have found many versatile programs that have turned my ADAM into a computer powerhouse. I have found so many, in fact, that I just don't understand the remarks that people make about there being no software for the ADAM. They must not be familiar with CP/M or better yet, not be familiar with its improved replacement, T-DOS.

But where do I begin! I have already said that I wouldn't be able to rank these programs. Sure, I can think of a lot of programs that are more useful than others, at least to me. So I will just start in and, as I go along, I will point out the reasons why I think they belong on the "best seller" list.

(The term "best seller" may be misleading, inasmuch as most CP/M programs are public domain).

MBOOT.ASM

I can easily identify the program which, in my mind, is the most influential CP/M program ever devised, as far as ADAM is concerned. I know it will come as a surprise to many old time devotees of CP/M, but the program I rank the highest of all in this category is MBOOT.ASM.

This program is the one program that began opening the entire world of CP/M to the ADAM.

Way back in the early days of the ADAM, after Coleco had brought out ADAMLINK II, we could communicate with bulletin boards and other computer owners, but the only programs that we could download were ASCII text files.

To be sure, we could purchase a limited quantity of CP/M commercial software from WESTICO. They offered a nice communications program named ASCOM which cost $240 with documentation. Does anyone remember CONDOR, a database software that cost $340. Don't gag, but DBASE II sold for $495. COBOL was a mere $700. FORTRAN-80 was $500 and PASCAL was $350.

Actually these prices were not at all out of line. Just drop in any software store and finger the Yuppie merchandise today! Even this limited line of WESTICO software was not available for long. They went out of business before Coleco did.

(Editors Note: See the more presently much more affordable prices of some excellent commercial CP/M (T-DOS) software offered by the advertisers in this ASG; like the excellent WordStar 4.0 for only $120.00. Prices have really dropped!)

So for the most part, we were left hanging out to dry. I could only look at the directory of files on various BBS and salivate over those great, free public domain programs that I could never access.

But MBOOT changed all of that forever. MBOOT.ASM was written in ASCII text, which I could download with ADAMLINK II. With the ASM.COM that came with my ADAM CP/M 2.2 I was able to assemble MBOOT.ASM into a hex file, and with LOAD.COM I could make MBOOT.COM from MBOOT.HEX. And at that point I was in business.

My experience was the same as that of hundreds of other ADAM users of that period. John Mesiavech who was the ADAM guru on the Compuserve Creative Computing forum, had developed a number of helpful suggestions on how to use MBOOT.

Believe me, it was not at all straight forward going from MBOOT.ASM to the actual downloading of a binary file. Many people wrote extensively on this subject. There was a file

named ADMBOO, written by Tim S. Coombe, of Chicago, that was adapted from MBOOT for the ADAM. MBOOT was basically the work of Keith Petersen with some help from John Taylor; but it was based on some fundamental work by that computer genius, Ward Christensen.

Despite Tim Coombe's rather explicit instructions and John Mesiavech's college try, it wasn't until Barry Wallis cleared matters up in his articles in MIAD and Compuserve in June of 1985, that it was possible to make MBOOT work on the ADAM. (Barry, incidentally, was a charter member of IBAUG, and we are sort of proud of that).

(Incidentally, at that time, nobody knew the code for auto dialing and so, with MBOOT, you had to dial the desired number by hand, and then transfer the operation back to the computer).

The important thing to remember is that with MBOOT you were able to download binary files! Then better programs, (written for other computers than the ADAM), could be downloaded as they developed. For example, when MDM747 was developed by Irv Hoff, it was only a matter of a few weeks until it was configured for the ADAM.

Then MEX came along and the ADAM was in clover. People today, have no idea of the problems that had to be surmounted before good modem software was available for the ADAM. Today, most people who want to get a good modem program, get it from someone who has been through the agony of those early days. Hundreds have gotten their IMP or MEX from those generous CO-SYSOPS of the ADAM forum on Compuserve, Rob Friedman and Tim Hunes.

Even though one can get an outstanding modem program, just for the asking, or can get one of the many other programs that came to ADAM as the result of MBOOT, (programs that ADAM owners now so readily take for granted); that in no way lessens the significance and importance of that "MBOOT breakthrough". And wouldn't you know it, those guys who developed it, had never heard of the ADAM!

Today, no one would even consider using MBOOT unless it was just for gaining the experience of using it.

Now that I have given honor where honor was due, here are some of the best CP/M programs that are available for, and work perfectly on, your ADAM.

MEX14.COM

I believe that one of the truly outstanding programs is MEX14.COM. It goes under a few other names such as MEX-03.COM and MEX-12.COM etc. But the basic MEX program by Ron Fowler is the fundamental program in all of these versions. In fact, only very minor modifications such as re-assigning ports to permit it's use with external modems, and the changing of baud rates are made in these newer revisions.

There has never been such a completely versatile modem program as MEX. Many people shy away from MEX because they consider it to be too complicated, but I guess that of natural course, "complexity" accompanies "versatility".

There are a great number of incredible possibilities with this program. For example, a few years ago I set up MEX to execute a whole series of operations by just pressing one key. I pressed it, and it went into action, it
1.opened a log file, (log of all the following transactions), on a separate drive,
2.dialed up Compuserve,
3.logged in,
4.then went to the FAMILY COMPUTING Forum, and
5.went to the ADAM data library, and
6.downloaded a selected file from that data library to another drive on my ADAM. Then it
7.departed the data library, and
8.then exited the FAMILY COMPUTING forum;
9.then it logged off of Compuserve, and
10.closed the open log file. Finally it
11.disconnected my modem from the phone line,
12.displayed the directory of the drive having the new files, and
13.logged out of MEX and returned to CP/M!

THIS WAS ALL DONE WITH JUST THE PRESSING ONE KEY!!

MEX just has to be one of the all time great CP/M programs. MEX is public domain software, and the Documentation is outstanding!

VDE266.COM

This program is one of the best word processing programs extant. It is the creation of Eric Meyer of Bloomington, Indiana. It has gone through many revisions over the years. Eric announced that version 266 will be the last. The reason being that he has made all of the revisions that he felt a word processing program should have.

He just couldn't see anything major that it needed that it doesn't already have. And I tend to agree.

It is so fabulous that I can't praise it highly enough. Like MEX, VDE266 is extremely versatile, and therefor it takes a little bit of use to become comfortable with it. Although it is hardly for beginners, I don't think that any reasonably intelligent person would have any problem with it.

You can do some very fantastic things with it, such as
1.inserting a file into the text you are writing, (or have written), from another disk or DDP. You can
2.move blocks of text around with the greatest of ease,
3.insert or delete words, letters, sentences or paragraphs extremely easily.
4.It has provision for MACRO keys that will perform tasks or add text.
5.Finding words or phrases can be done forward or backward, case sensitive or case insensitive. You can
6.find and replace any word, (or dot command), or phrase. You can
7.replace just once or at every occurrence of the word.
8.It has an auto indent mode. And
9.it can go from the top of a body of text to the bottom in a flash!
10.Or it can go from the bottom to the top with equal speed. It does this faster than any word processor of which I know.
11.It has a screen header that displays all sorts of vital information about the text file upon which you are working.
12.If you want to know exactly how big the file is at any time, there is an information command that will tell you how large the file is, how much memory it is using, and how much memory is remaining.
13.When you save a file to which you have been adding text, it will make a backup copy of the starting file, (so that if you are dissatisfied with the changes, you still have the original file intact).
14.If you have been merrily writing away and then try to save your splendid text, only to find out that there isn't room enough on the disk for the file, "not to worry". You can pull out the full disk and replace it with a fresh disk. No need to do a warm boot. Just go ahead and save the file.
15.You can make a window of the screen display, and return to normal screen display at will.
16.You can double space type, or
17.set tabs or
18.clear tabs. You can
19.save the your working text to disk and resume typing.
20.You can quit without saving the work to disk or
21.you can quit and save the text as you quit.

Documentation on early versions was only fair, but at the present time VDE266 documentation is outstanding

You can search far and wide but you will probably never find a word processing program better than this one. And it is a public domain file.

There is a companion version of VDE266 which has been especially configured for writing screen plays. Professionals who use this program swear that it is one of the best screen play programs around, regardless of cost.

MPRINT.COM

This is a nice ancillary program for any word processing or text printing operation. It is especially useful for the changing of text formatting after you have written a document, but later wish to change the page length or perhaps double space what had been single spaced text.

Or maybe you would like to add page numbering or offset the text. All of this can be done with MPRINT and more. The nice thing about this is that you don't have to go into the text and make the changes, and the output can be studied and changed again where needed. It does not change the content of the file it prints, so nothing is disturbed. It just prints it out in a different manner, if you so direct. You can try out a lot of different text arrangements to find the one best suited to your taste.

One essential application that comes to mind is in the preparation of screen plays. The indestry has a strange, (to my thinking), requirement that all screen plays must be offset by 18 characters. It would be enormously difficult to create a text that way. But it is extremely easy to create the screen play with VDE266SP and, after the text has been written, type out the copy for submission with MPRINT and use it to offset the printing. It is the only program of which I am aware that will provide offset, (except the $600+ SCRIPTOR).

MPRINT is very easy to use and is totally menu driven. It permits the use of wild cards and is very fast. Documentation is sparse, but generally adequate. For those who might want to alter the program, the library file that contains MPRINT.COM and MPRINT.DOC also contains the source code. This excellent program was created by Peter Brawley of Toronto, Canada.

RUN80.COM

RUN80 is one of those absolutely outstanding programs made to order for the writer. It may be used with any text editor and works superbly with VDE266. It is not a new program, having been created in 1981 by Ted Shapin of Orange, California.

RUN80 is not an "after-thought" type of program, like MPRINT. If it is intended that the RUN80 features will be used, then the writer must incorporate the various dot commands in the original text. This is no problem whatever.

The special features that RUN80 provides are quite impressive.

For example, you can use it to underline a single word of text, or a line or even paragraphs of text. That alone, is

reason enough for using RUNSO. It will permit you to set the page length to any number of lines. If you are printing your results on standard fanfold paper and you select 66 lines per page, then the printed copy will be precisely printed, page after page, with the text beautifully centered on each page.

RUNSO will permit you to set the right and left margins and if, later on in the document, there is need to create columns of data, you can reset the indentation accordingly. There is a command that will temporarily indent one line only. This is beautiful for indenting the first line of a paragraph, as I do to express emphasis in many of my documents. It is just as easy to "outdent" a line for certain types of emphasis.

Not everyone is enamored of right hand justification. Many think it is too structured and too formal for personal correspondence. I tend to agree. But for preparing text for publication, such as articles for a newsletter, where column spacing is often imperative, then right hand justification is "justified". This is one of the options that RUNSO provides.

It is very easy to turn justification on or off with RUNSO, and I have had to change justification within a single document on many occasions . An example of where you have to do this would be a case where you were making columns of data within a document. Here you want the data to line up just as it appears when you write it. There are only a few programs that provide for justification at will. I know of none that are public domain.

With RUNSO, you can have both headers and footers that will appear on each page of type. This is often of great value in many documents. These headers and footers are totally optional and may be changed at any time in the text. There is a command that will permit you to start the header with leading blanks, a feature which very few other programs provide.

You may introduce any number of blank lines with a built-in command. This function is quite useful in formatting text, where the separation of certain bodies of text occurs frequently. There is no need to plan out and introduce blank lines with a carriage return, if you know just how many you need.

The default line spacing of RUNSO is single line spacing, but there is a command which will permit you to select any line spacing you prefer. This too, may be changed anywhere in the text. An occasion might arise where a portion of the text might be more effective with double or triple line spacing, but the overall text would be single spaced. (MPRINT won't provide this tailored line spacing, but RUNSO will).

Page numbering is provided for too, and it is possible to introduce a new page number at will anywhere in the text, (as in the case of desiring to insert a page later, after the file printing has been done).

And another beautiful feature of RUNSO is that it has the ability to center any number of lines of text, (such as the title line of an article). You may turn the centering on or off anyplace in the text.

I mentioned that you may use a temporary indent command. You may also change the indentation AND right margins with a plus or minus margin command which will change the margins from their present setting by a specified number of characters. This is not a big feature, but it adds a bit of versatility to the formatting process.

There are other provisions such as tab setting etc. But this is not a documentary on RUNSO. Incidentally, the documentation for RUNSO is extremely complete and clear.

SPELLM20.COM

Are you any good at spelling? Maybe so, but how about your typing? Did you ever hit the wrong key or omit a key inadvertently? Well here is a terrific public domain spelling checker that is about as good as they come.

SPELLM20 was very well conceived and has provision for updating new words that aren't in its vocabulary. There are spelling checkers, and then there are spelling checkers. I recall a commercial checker for the ADAM to be used in MOS that was a disaster. It was infernally slow and had a lot of misspelled words.

SPELLM20 is highly recommended by me and especially so, when you consider that it is FREE. It is easy to use and is fairly fast for a spelling checker.

The present version is the work of Michael C. Adler of Lexington MA, and is based on a major dictionary created at Stanford University by Ralph Gorin. SPELLM20 was brought to MIT by Wayne Mattson, and there it was revised both in program and vocabulary by William Ackerman. It is not a new program as the version 2.0 by Michael Adler was published in December 1982.

The documentation for SPELL20 is excellent! The main vocabulary consists of about 40,000 words and is 56K in size. In my own version I have updated the dictionary with about 7500 additional words.

The relatively small size of SPELLM20 permits it to be used easily with two ADAM drives; one to hold the program and vocabularies, and the other to hold the document being checked.

THE WORD PLUS

THE WORD PLUS is a commercial spelling checker and is absolutely excellent! There may be better ones, but I am not aware of them. The program is copyrighted by OASIS SYSTEMS, and it has been updated; and at this time I don't know what the latest version might be, or how you you can tell what version you have. The fundamental program does not appear to have been revised; just the vocabulary. That has been considerably enlarged. My first version had 137K in the main vocabulary and my "latest" update has 164K. My personal update has added over 50K of additional words not in the main dictionary.

This program is too big for anything less than a 3.5" drive, (720K). It could conceivably be used on a DDP, but that would make it extremely slow. As the vocabulary grows, the operating time to check a file increases.

In general, "spelling checking" is one of those operations that you set in motion; and then go find a crossword puzzle to work while it processes the file. The slowness of checking is doubled or tripled if you instruct it to place a new word into the update dictionary. That takes an extremely long time.

THE WORD PLUS is not simply a program, but rather a collection of programs that make up a system.

It has an anagram program and a review program and two update dictionaries.

It has a sorting program and a lookup program and a markfix program, (it will make corrections to your text if you so desire).

There are several other programs that make up the system, so it's not at all suited to a standard disk drive. The vocabulary alone is much too large to fit on a standard CP/M 145K disk. But I must say, it is sure one fine spelling checker. When I first bought my 720K drive from Orphanware, I about gave up on THE WORD PLUS, because with, that drive it was simply too slow for any serious use. But then Orphanware came out with their new eprom for the 720K drive, (the GLH version), and that made it all worth while.

QK21.COM

This program, better known as QuikKeys, has to be one of the all-time most useful public domain programs. Frankly, I don't know how I could function without it. I use it in connection with every kind of operation.

In my telecommunications work, (using my modem), I have special keys configured to make modem operation much easier and much more simple.

In word processing I have an entirely different set of specially assigned key functions.

In search operations, I have yet another configuration of QUIKKEYS.

This program is beautifully adapted to the ADAM because there are 15 keys on the ADAM keyboard that serve absolutely no function at all in CP/M. These keys can be set up with QK21.COM to perform much needed and often complicated functions. Anyone who owns an ADAM and CP/M and doesn't make use of this program, just simply isn't functioning efficiently. I'm serious. If you aren't using this program, you are just putzing along.

QUIKKEY is not exactly new. It is the work of Tony Fleig and has been upgraded at least twice since I have known of it. Version 2.1 was released in March 1985. There may be a newer version, but I have not run across it. I would certainly want any update of this splendid program. This is one of those programs that seems to give you something for nothing. You don't have to be deprived of any normal key function, although it is possible to configure just about every key on the keyboard to perform some special task.

Let me give you an example. In most word processing programs, such as VDE266, there are a number of Control commands that involve two or more keys. To exit and save the text you are editing, the command is Control-K X (^KX). (In earlier versions of VDE it was ESCAPE X). Both of these are three key operations. It is easy with QUIKKEY to configure one key, (the PRINT key, for instance), to do the three keypress operation with only one keypress.

When I am in modem operation, I have one key configured to load and execute MEX so that it will select the desired baud rate; load my MEX phone directory; configure my MEX signature; dial Compuserve; and a host of other operations. Another key is pressed to cause the "logging in". There are three log in functions in CIS. First, a Control-C is required, next your user I.D. and finally your password. I have three keys in a row with this data. So I just press one key right after another without having to be aware of exactly what information is actually transmitted.

Although there is a limit of 31 characters to the string you assign to a given key, you can make those 31 characters perform a lot of functions. There is also a limit of 31 keys that may be configured, although I have never found a need for more than 20 thus far.

Where this program shines is in the issuing of complicated

commands that could be easily messed up by a typing error. I generally have a few keys in reserve which I can configure for just a one-time use.

Suppose I am going to send a message to someone on Compuserve and I want to be sure that I have his name spelled correctly, and that I have his CIS I.D. correct; (and I don't want to take a lot of time reassuring myself of correct typing while I sit there donating funds to SPRINT). Well, before I even sign on Compuserve, I configure a key that has all of this information ready to send with just one keystroke. Then at Compuserve's prompt for his name, for example, all I do is hit that one configured key, and off it goes to CompuServe.

Removing all of the special configurations is a very simple operation too. And it is just as easy to restore one key to it's original function without changing any of the other specially configured keys.

Although this may sound dumb, you can even assign one key's meaning or function to another key. For instance, you can assign the dollar sign, ($), to the uppercase 7, (&), if you are so inclined.

That is a frivolous example, but a better one might be, that when I am using WORD266 to prepare an article such as this one, I hit one key that sets the page length to 65; sets the right margin to 61; sets the left margin to 1; centers the next 50 lines of text and finally turns off the right hand justification.

Then after I type in the title of the article, I press another single key and I remove the centering feature, put in a couple of blank lines; restore the right hand justification and set the temporary indentation command for the first line of the body of the text. All of this is done with just two keystrokes. And I could have done a lot more if I had a need for it.

So useful is this program, that in certain operations I have two sets of QUIKKEY assignments. One set will configure my special key functions for one operation, such as a set of word processing functions. Then I have an entirely different set for performing search operations. These keys can do a whole array of functions that otherwise would be tedious, to say the least.

Loading a new set of key functions as needed is easier than telling about it. The QUIKKEYS program is a "godsend" to CP/Mers.

TELL.COM

This is a CP/M utility that will provide a lot of information about your ADAM system. It's not the kind of program that you will use every day, but there are many times when you may find it useful.

It is very easy to use; all you need to do is type "TELL" and press the carriage return.

The TELL program provides information about where your CCP starts, what your BDOS entry address is, and where your CBIOS jump table begins.

You can determine the size of your TPA from this information. (The size of the TPA is the space from the start of the TPA, (which almost always starts at 0100H), to the beginning of the CCP). All you have to do is to compute the difference between the CCP start address revealed by the TELL program, and the TPA start address, 0100H.

The expanded TPA, (that is the size of the TPA when it overwrites the CCP), can be computed by finding the difference between the start of the TPA and the beginning of the BDOS entry address.

Of course, it tells you almost everything you need to know about where things are located. This is a nice program which I have found to be very useful.

TPA32.COM

This is another program that will tell you the size of your TPA. Sorry folks, but that's all that it does. It gives you the size of the normal TPA and also the size of the expanded TPA.

To use it, just type TPA32 and a carriage return. (With this program you can check the HEX arithmetic you performed in the manual calculation of the TPA with TELL.COM).

ERASE+.COM

On occasion you may erase a file or maybe a group of files, only later to wish that you hadn't. In that case this is the utility for you.

It is completely menu driven and very easy to use. It is fast, and it will retrieve any file that has been erased BUT NOT YET OVERWRITTEN. (If the file has been overwritten, there is NOTHING you can do to get it back, it is gone!). There is always a pretty good chance that your CP/M hasn't overwritten a file, or perhaps at least that it hasn't overwritten all of it. It won't overwrite if it still has some virgin file space that hasn't yet been used.

You don't have to know a thing about CP/M programming or how

CP/M files are constructed to use this program. If you are experienced in CP/M directory structure, you can un-erase files yourself with a good disassembler, but with UNERA+ you can do it without having to know how it is done. This is a very useful and highly recommended program to have.

DU-V87.COM

DU-V87 is similar to JKL Utilities in many ways. Fundamentally it is a disassembler. When you load it, (by just typing DU-V87 <CR>), it goes into memory and then you can examine the data on a disk, (or RDP), on any drive. You can look at a disk on the A:Drive and then switch to the B:Drive and look at a disk there. But DU-V87 is still in memory.

With DU-V87, you can recover an erased file, or you can relocate a file from one user area to another user area.

One time I was using an exotic program which stored an interim section of data in User area 15. There was nothing said in the documentation about this procedure. But on one occasion, when the program malfunctioned and didn't complete its task, it left the interim storage in User area 15. When I looked at the directory, (I was in User area 0), I didn't see these interim files. Yet the number of bytes remaining in the directory was much less than I would expect from the files that were stored on the disk.

I was very puzzled by this, and not knowing about the User area 15 procedure, it never occurred to me to go to that area to see if anything was there. But when I looked at the disk with DU-V87, there it was as clear as anything; a large amount of temporary data was stored in User area 15. I erased those files right then and there with DU-V87, and when I returned to CP/M, I found that I had recovered the "lost" space.

On several occasions, when I have accidentally trashed a disk directory, but had maintained the actual file content intact, I was able to use DU-V87 to find and identify each file. Then, little by little I was able to reconstruct the directory and thereby salvage a vital disk directory, whose loss would otherwise have meant the loss of many hundreds of hours of work.

There is excellent documentation for the use of DU-V87 and it covers well the many, many features of this outstanding program.

It's a small wonder that this program is so great. It was originally created by that genius, Ward Christensen, and was updated and modified by Ron Fowler, Irv Hoff and Jeffrey Bonken. Now there is a brain trust for you!

This is another one of the ABSOLUTELY MUST HAVE programs. Like MRI and VDE266, this program is an extremely versatile program. I simply wouldn't feel that I was using CP/M successfully without it.

There are many versions of the DU program. One very widely used version is DU-V89.COM. I have it and have used it, but there is a flaw in DU-V89, (and also in DU-V77), which is reason enough to not recommend them. These two won't print out a hard copy of their results. The only DU version that will print out the results on the ADAM is DU-V87. And having a hard copy of the output of DU-V87 is often mandatory.

AAND NOW A BIT ABOUT SORTING

One application that computers accomplish with ease, is the slavish sorting of mountains of data. This can be alphabetical sorting of lists, or the compiling of lists of numbers in ascending or descending order. This is not only sheer drudgery for humans, but it is extremely easy to make mistakes. There are a number of sorting programs that work well on the ADAM, and they are quite fast.

SORTV-15.COM

This marvelous sorting program was originally written by Ward Christensen and amended by Keith Petersen, Ted Shapin and D.L.Anderton. It is a very short program and it has the source code available if you wish to make any changes in it.

You can sort a file and replace the old file with the sorted version.

Or you can place the sorted file on another drive if you prefer.

Or you can have the original file and a sorted version on the same drive.

I have tried many sort routines, and this is one of the very best. I have never found it to make a mistake, even on the ADAM. Other sort routines, written in SmartBASIC, fail miserably on the ADAM when sorting large volumes of data. (There just isn't room, when SMARTBASIC use 27K, and the BASIC sort program uses a bunch more). Incidentally, these same programs written in Microsoft Basic or in Pascal work just fine. Could it be that this is because all of these reliable systems are in CP/M? That's a point to ponder!

DICTSORT.COM

This commercial sorting program performs an additional

function that most sorting routines do not perform. In sorting a list of words, it will reject any word that appears more than once. It sorts word lists and converts the list to uppercase and will throw out any word that is repeated. Quite often this is a very desirable feature.

AND NOW SOMETHING ABOUT SEARCHING

Another laborious chore, for which the computer is well suited, is the searching of a document for a word or phrase. On different occasions the searching operation may be applied in any one of a large variety of ways.

FIND.COM

This superb program, written by Irv Hoff, is one of my most widely used CP/M programs. In fact, I use it so extensively that I almost think of it as a basic part of CP/M; and not as a separate program. It, too, is a highly reliable program.

You can search extremely large files for a single character such as the tilde (~) or you can search for versions of a word or search for several different words in a single pass.

While a spell checker would accept "token" or "taken" you might want to check a file for every use of either word. FIND.COM will do that in just one operation. The same might be said of the words "piece" or "peace". If your spell checker marks a word with the "at" symbol (@) or a tilde (~) you can use FIND.COM to locate every such marked word by searching for the symbol only.

And suppose you have a whole disk full of files having the same filename but a different file extension, (such as COMPUSRV.348, COMPUSRV.457 etc.), and somewhere in these files, you would like to find each occurrence of the name of Pat Herrington.

With FIND.COM, you can search every file on the disk and it will identify the file by name, and every occurreace of the name. And this is done with just a short command line.

Also FIND.COM has a very handy way to discriminate between lower case searches and uppercase or mixed case searches.

There are a variety of versions of FIND.COM, and all of those that I have used are excellent. However, the version 5.2 is the one that I recommend. It permits the making of a disk file of the search results, and it also has an added feature of allowing for a search for words preceded by a tab.

It will also search for strings starting at the beginning of a line.

FIND.COM is especially useful in conjunction with cataloging programs such as NCAT and XCAT, (more about these programs shortly).

The documentation is excellent.

SEARCH.COM

This program is an exotic searching program that is much more sophisticated than FIND.COM. SEARCH.COM will locate and report whole paragraphs or even pages of information containing a specified word, letter or string of words. It is suited for use with specially prepared files that are arranged to make a later search for specific data very easy.

SEARCH.COM is a relatively new program written by Eric Bohlman. There are two versions: an earlier version, (version 1.5); and the current version (version 2.2). Both are excellent and both have very good documentation.

SEARCH.COM can be operated with a long command line that sets up the search mode. Or it can be invoked with just the single word SEARCH and is menu driven from this point on. When one becomes familiar with the program he will likely prefer the "compound command" line.

With SEARCH.COM you can search a file for a word or just for a unique character. But you can also search for a combination of two or more words or characters. This makes the search function quite unique. But even more than that, you can search for this unique combination OR another unique combination. If either combination is found, it will be reported. And by reported, it may merely be reported to the screen or, if you have so directed, it will report the results to the printer or the results can even be placed in a file which you have named in the command line.

This is extremely powerful stuff.

SEARCH.COM can be used in specially constructed files that will identify stored information that is related to, but actually not, the data being searched. SEARCH.COM is one of those truly outstanding CP/M public domain programs.

The documentation is excellent.

AND NOW BACK TO SOME OTHER STUFF

NEAVE.COM

This is a little known; small, (1K), file that can save some of you a lot of time. This program will protect files stored in the M:Drive, (your memory expander), from being wiped out

with a cold boot. There are a number of other programs that provide this protection, and T-DOS provides this protection automatically unless you turn off the computer to go back to BOS. But for those who don't have one of those other programs, and have failed to graduate up to T-DOS, this program is very useful. The only time it appears to fail is when you boot an BOS file such as JKL Utilities and then go back to CP/M. But apart from that, it allows you to cold boot disks as often as you wish and not affect the files in the M:Drive.

CLONE.COM and IMAGE.COM

These two programs by Chris Mills are complementary programs. You can create a CP/M file with IMAGE.COM out of blocks of almost any kind of data. You can reproduce the original data from this CP/M file with CLONE.COM. Clear? --rrrriiiight!

Well then, just how are they used and of what value are they?

If you have a machine language program such as JKL Utilities or SMARTBASIC and you want to make a CP/M file out of it so that it can be transmitted via a modem; or can be crunched to make it smaller, (or both); you can do this with IMAGE.COM.

Later you can re-create the original JKL Utilities or SmartBASIC, (or whatever), with the CLONE.COM program. These programs are menu driven so there is not much need for a documentary file. (That is just as well because there are no documentary files).

As a rule, LOGO, SMARTBASIC, JKL Utilities, SMARTFILER, RECIPEFILER, etc. can be crunched to less than half of their original size after they have been "imaged". This is the only tool of which I know, that will enable you to compress BOS files. It doesn't matter if the data you IMAGE into a CP/M file is BOS data, CP/M data, machine language data, ASCII or binary data; you can make a CP/M file out of it. You might wish to make one single CP/M file out of the CP/M directory plus all of the CP/M files on a disk. You can do this with IMAGE.COM. The only caveat is that the new file must not exceed a file length of 145K or it won't fit on a standard CP/M disk.

After you make this new CP/M file, it can be processed just like any other CP/M file.

MCAT.COM & XCAT.COM

The need for cataloging your CP/M files eventually becomes the uppermost concern in the management of your data. If you have thousands of files, how can you hope to be able to find anything?

Long ago, I had to set up an effective cataloging system. I tried a few programs and settled for Irv Hoff's MCAT version 4.1. He released this in Jan 1984 and it was based on some very early work by Ward Christensen. There were a number of disadvantages to this version and in August, Irv brought out version 4.5. This was much better and more reliable. I used this for quite a while but it behaved very strangely as the number of catalogued files grew. It would allocate exceedingly large amounts of space for simple entries which caused a rapid decline of available file space.

In July of 1985, Harold F. Bower released MCAT504 which was based on Irv Hoff's concepts, but MCAT504 was highly superior to its predecessor! It could handle files right up until it ran out of dist space.

One very nice feature it has is the ability to delet a disk entry altogether.

Suppose that your catalog disk was quite full and you then resumed cataloging on a new dist. Later you added new files to a disk that had been cataloged on the crowded catalog dist. But when you tried to recatalog this disk, there wasn't room on the catalog disk for the new data.

Here is where the deletion of a disk entry is useful. You can delete all of the entries of any disk that has been cataloged. By deleting these disk entries, you make space available for revising entries on the crowded disk.

With MCAT504, you can delete some of the last disk entries and place these in a new catalog. MCAT504 has proven to be extremely reliable. But it is a bit more difficult to use than MCAT45. It was written for the Kaypro, but I have adapted it for the ADAM with no problem whatever.

MCAT504 was configured for the DATESTAMPER program, but this has never been made available for the ADAM. You can however, manually date stamp each entry.

MCAT504 has an outstanding documentation file. And so do MCAT41 and MCAT45.

There was a companion synergistic program written by Irv Hoff for MCAT45 called XCAT. This was released in November 1983 and it was a valuable addition to MCAT. This was upgraded to version 4.2 in August 1984. XCAT42 works perfectly with MCAT504 and both files should be used together.

There is no way on earth I could manage my inventory of well over 7000 CP/M files without MCAT and XCAT.

There have been other cataloging programs, most notably Steve Cohen's FATCAT20, FATCAT21, FATCAT22, FATCAT23 and in

June 1986, FATCAT24. These programs are just not ADAM friendly. They all must be heavily configured to run on the ADAM. Even then, there are so many ancillary files needed to operate FATCAT, that there is virtually no room on a 5.25" floppy disk for the catalog itself. The length of the fundamental program FATCAT24.COM is 24K as compared with the length of MCAT504.COM which is 7K.

PRINTMASTER

Are you interested in a superb, (make that outstanding), graphics program for your ADAM with a dot matrix printer?

There is a commercial program called PRINTMASTER which can do all kinds of splendid operations. With it you can make banners, greeting cards, calendars, signs and stationery. It comes with eight very special fonts and eleven borders and a whole host of graphics. And if these graphics are not sufficient, you can get two additional files, both of which are filled with graphics for every occasion.

I can't recommend this program too highly. It is the product of Unison World Inc., and is sold in MSDOS and CP/M versions. I bought two PRINTMASTERs and they were configured for the Kaypro 4. I converted these to ADAM format using UNIFORM, (from Micropro), and they work perfectly. This is the best graphics program I have ever encountered for the ADAM!

BRADFORD.COM

Aaron Contorer wrote a commercial font program for CP/M computers that have a dot matrix printer that is nothing short of sensational. Sales of this excellent program did not meet his expectations, so he released it to public domain with a small proviso. The proviso was that he wouldn't divulge the instructions for all of the many special features of this program until you ordered them from him at a nominal cost.

This seemed reasonable enough, but the only trouble was that the addresses he gave were not viable. I sent my order but the letter was returned. I tried to reach him by phone, but was unable to locate him. However, the program is available and it isn't too difficult to figure out most of his special commands. You don't need to make use of these very unique features of BRADFORD to make excellent use of this great program.

There were a lot of fonts added later to make about 24 fonts available for BRADFORD. Many of these fonts are available no place else, (such as the Old English font). Each font can be printed in a compressed manner or a stretched manner. You can stretch the fonts to an extreme degree. There is really nothing to compare with BRADFORD, although there are several other font programs around. I have used BRADFORD with an EPSON LQ-510 and with an antiquated Epson MX-80 and the results were sensational!

Aaron Contorer has written an upgraded version of BRADFORD called BRADFORD2. This has a large number of fonts also, but it won't run on a standard ADAM. It requires a larger TPA than we have. Realizing that this large TPA requirement exceeded 90% of the CP/M computers on the market, he revised BRADFORD2 into a smaller version, (with a few minor feature eliminations), but even this revision won't fit into ADAM's TPA.

FIG11.COM and FIG14.COM

These are a couple of fun programs. They are basically the same as each other, and I think that you would like either one of them. They will check anything you write, (such as this chapter), and determine if it is generally readable. That's a pretty tall order, but it does a remarkably good job of analyzing your writing style.

1.It will inform you of the average number of words you use in each sentence. It is good to have this pointed out to you because if your sentences are too long and verbose, they may be hard to follow. You may not realise that you are being long winded. But if you don't have an editor to proof read your material, FIG11 can be very helpful.

2.It counts the number of commas and parenthetical comments you use.

3.It also counts the number of large sized words, medium sized words and short words that you use. You know the old saying, "use a short word if it does as well as a long word." Well this program will call you on it. Long words may very well be justified, but it lets you know if you are using a lot of them.

4.Oh yes, it even counts the number of exclamation marks you use. I once wrote a piece when I was very agitated with the person I was addressing. It must have shown, because FIG11 asked me "Why are you shouting?" I guess I had over used the exclamation mark!

5.Finally it rates your overall work with a FOG INDEX.

This program uses a somewhat complex system to evaluate the overall clarity. On the whole it does a remarkable job. For those of you not familiar with communication courses, there is a term used in writing and speech classes called the "FOG INDEX". In general a FOG INDEX of 8 or lower can generally be understood by nearly everyone. A FOG INDEX of from 9 to 13 can be understood by most high school graduates. If your writing rates a higher number, you had better reconsider your audience or tone your stuff down a bit. FIG11 can have some biting comments about your display of erudition. (Editors note: display of ern-what?).

Try these programs. I think you'll find them a lot of fun. And who knows, maybe they might be helpful as well.

SDCPY.COM

This is a single drive "copy utility" that is most useful. I use it frequently, even though I have multiple drives. It is a short program, (2K), and it needs no documentation because it is menu driven.

I have found that it is flawless and will copy any size file that your disk can hold. For those who have just one drive, SDCPY will permit you to copy a file from one disk, (or DDP), to another using just one drive. But for me, it has two advantages over any other copying program.

1.I use flippies, (the cheapskate double side disks). I sometimes want to consolidate files onto one side of a disk when some of the files may be on the back side. I could copy such a file onto a spare disk, (having two disk drives), and then recopy the file back onto the reverse side of the first disk. But with SDCPY, no need for that; I just insert one side for the source and then turn it over for the destination.
2.Another excellent feature of SDCPY is that it can crowd a file on a disk right up to the 145K limit. Have you ever tried to PIP a file onto a disk that should be able to hold it, (when even with the copied file it would have, say, only 143K total); but it aborted with a "disk full" error message? Well with SDCPY you can cram a disk right up to the max.

It is an excellent program to have. SDCPY.COM was written by Cameron W. Cotrill in 1985.

SPLIT45.COM

There are a few times when a file is too large to manage. The reason may vary; for example, VDE files may be too large to fit in memory: a file on a hard drive or on a 3.5" disk may be too large to fit on a floppy, but you may want to store it for archival purposes on the cheaper floppy. You might want to split a large file into smaller segments to send it by modem to another ADAM user. (Often modem transfers will fail when the file is too large. This is always the case when the receiving party is using a digital data pack). Or sometime you may have a large file on a double sided disk and you need to split it to fit on single sided disks.

Whatever the reason, there are times when one needs to break up a file into smaller files.

Of course this can be done with PIP.COM, (It was designed for that), but it is too cumbersome for most people to use with ease.

SPLIT45 is a program made to order for splitting files. It will split files in three different ways. You might want to
1.specify the number of lines of text that each new file should have. Or you might want to
2.split the file into equally sized files. For instance, you might just want it split into two approximately equal files, or three or four, etc. (When I say approximately equal I mean as nearly equal as it can be done, which in most cases is exactly equal). Or you may wish to
3.split the file into files having a specified number of 128 byte records in each subfile. The number of records in each subfile is your choice (128 bytes is equivalent to an ADAM disk sector).

Later, as needed, you can reassemble the split files into the original large file. SPLIT45.COM will split ASCII or binary files with the same easy procedure. This is a fairly new program written by Mike Diagacci and is easy to use and very reliable. The documentation is adequate but not very clearly written.

CHOPVDE2.COM

I mentioned above that one has a need for splitting a file when one has to edit a large VDE file that won't fit in the TPA. As great as I think VDE266 is, it has one limitation that is sometimes a bother. It is limited to the size of a file that can be processed in the dynamic memory. That size varies quite a bit from one file to another. Generally 45K is about as big as you can have in memory.

(The reason for the variance is that VDE uses a compression technique and often the size of a file in memory is about 25% less than the actual size of the file). But it does have a limit and I have found many cases where a VDE file is much much larger than the memory can hold.

Some of you may question how I could create a file in VDE266 that is larger than VDE266 can handle. The answer is CHOPVDE2.COM.

For example, our IBAUG membership file is considerably larger than the memory capacity of VDE266, and because of the attendant inconvenience, I wouldn't even think of breaking it into a series of smaller files.

For one thing, this membership list contains a large amount of information about the members, information that is not always needed in a particular use of the list. Like when we compile our mailing list for the newsletter, we don't want to include phone numbers, equipment owned, titles, etc. Yet we use the same master list to glean this mailing list from the

overall data. If we want to create a list of organizations that we exchange newsletters with, we want to search the entire list at once and not go searching through four or five sublists.

CHOPVDE2.COM is a program that enables me to split the master list into a couple of manageably sized files that will fit into VDE266 memory which I can then revise. New names and data are added to the last section of the split list.

CHOPVDE2.COM then reassembles the split files back into a master list. This it does with much greater facility than SPLIT45.COM or PIP.COM.

Ron Rock, the author of this outstanding program has provided everything one needs to split open a large VDE file and reassemble it when finished. This program removes any vestige of reservation about the use of VDE because of file size limitations.

I tested this program by concatenating a very large fictitious text file, (over 300K), out of a bunch of unrelated smaller ASCII files. This was put on a 3.5" disk. Then I tried CHOPVDE2 to break it down into ten small files. No problem! In fact it wasn't even particularly slow. So if you are writing a novel, and you thought VDE266 couldn't handle it, just remember CHOPVDE2.COM.

CRUNCH24.COM & UNCR.COM

I won't go into a long discussion about these two file compression programs because most of you are already well aware of their uses. In fact these programs have come to be taken for granted, as though they were always a part of CP/M. But no compilation of powerhouse programs for the ADAM would be complete without CRUNCH.

And these programs haven't been around very long either. I can remember attending a computer club meeting where I asked if anyone was familiar with this new program called "CRUNCH", and only one person knew what I was asking. I know many of you old CP/Mers will recall when SQUEEZE was the only program we had to compress files. And even to this date, that old standby "de-librarying" program NULU152 will not "uncrunch" a file but it will "unsqueeze" a file.

The ability to "compress" a file is certainly one of the superb features of CP/M. And it is a very important function. Compressing a file can save untold costs in transmitting files to and from a bulletin board. And big forums would be exceedingly cramped for space if all of the files on these BBSs were not compressed.

There are only three generally available compression techniques in CP/M --- SQUEEZE, CRUNCH and LZHUFENC. By far, CRUNCH is the most widely used. And it is likely to remain so, even though LZHUFENC is a bit more effective in compressing ASCII files. SQUEEZE.COM used the Huffman encoding procedure, whereas CRUNCH uses the Lempel-Ziv-Welch system. I am not sure about LZHUFENC as there is virtually no literature available about it.

Steven Greenberg is the author of CRUNCH. My first encounter with this program was with version 1.2 which he wrote in March 1986 and upgraded in June of 1986. Versions 2.0 and 2.3 received wide acclaim and the most recent version appears to be version 2.4. Unfortunately, as the revisions were released, files that were compressed with an earlier version of UNCR, could not be uncrunched with a laterversion. A file crunched with CRUNCH23 could not be uncrunched with UNCR24, etc.

The first scheme for hashing and linking was developed in "C" by Kent Williams in early 1985. His work was based on an article which appeared in the June 1984 issue of IEEE Computer by Terry Welch, who had previously based his ideas on those of A. Lempel and J. Ziv.

Kent Williams' program was incorporated into ARC version 4.0 by System Enhancement Associates. Even this was influenced by a couple of enhancements that came from a UNIX utility called COMPRESS.

Steven Greenberg not only produced some of the finest documentation ever written for a program, he has generously provided us with the source code, (written in Z80 assembly language), which is heavily commented; and with supporting documentation for the use of the source code. If only more programmers were so considerate!

CRUNCH is extremely well thought out and there is virtually nothing to wish for that isn't included. CRUNCH can function from any drive and compress a file on any drive and place the results on any drive of your choice. It was one of the first programs to do that. It automatically designates the compressed file with the character "Z" in the center position of the file extension of the compressed file.

CRUNCH will compress binary files, but the degree of compression is naturally less than it is for ASCII files.

LZHUFENC.COM & LZHUFDEC.COM

Having mentioned above a new compression technique called LZHUF, I will make a few remarks about it. Since virtually no documentation is available, one can only surmise that it is a merging of Lempel-Ziv and Huffman techniques. It does compress text files a bit more than CRUNCH.

LIHUF has extremely serious limitations, and is very unpolished otherwise. Programs that remove files from collections, (programs such as LT28.COM for library files and UNARC16.COM for ARCed files), will not automatically decompress LZH encoded files as they do CRUNCHED files. And that is a good segue into a discussion of a great new program, --LT28.COM.

AN ASIDE:
Rob Friedman (Compuserve CO-SYSOP for the ADAM forum) has suggested using the letter "F", (for freeze), as a designator in the file extension for any file compressed with LZHENC. This would serve the ADAM communitywell, (or more properly, "...serve the Compuserve-using ADAM community ..."), because they would "get the word" about the designation. But there is a vastly larger IBM CP/M community, (Osbornes, Kaypros, etc.), that share compressed files but don't communicate extensively with the ADAM community . If we were to post a file on a BBS with a designator of "F" in the file extension, I'm afraid many NON-ADAMites wouldn't realize that the file was compressed with LZHUFENC.COM.

Rob has suggested that, in addition to refering to the compression process as freezing, (using the "F" designator in the center position of the filetype); that the decompression process be referred to as "thawing".

(Editors note: It may have been about March in Long Island when Rob derived these thoughts. Long Islanders know all about "freezing" and "thawing" by March.)

LT28.COM

This program is the latest revision of a group of programs similar to those mentioned immediately above.

It is in fact a "de-librarying" program that will remove files from a library file, and will un-squeeze squeezed files; or it will uncrunch, (with UNCR23), crunched files. Or if no compression was used, it will remove those files and leave them alone.

The user doesn't have to issue any directions, (as is required in NULU152, discussed above); for these functions to occur. Furthermore, if he just wants to look at a file in a library, (whether crunched, squeezed or uncompressed), he may see it on his screen without storing it on a disk first.

You can select a file by name or you can use wild cards, (*.*), and see every text file in the library.

You can send the files directly to the printer or you can remove them from the library file to any drive for permanent use.

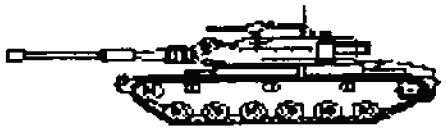
LT28 is the work of many people but the current version is the work of L.R. Falconer. The origins seemed to be based on a June 1983 program called LUIFYP by Stephen R. Holtzclaw. I downloaded my copy from Genie just a week after it was released on 26 May 1988. The upgrades, (versions 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28), had the contributions of men like Irv Hoff, Gary Inman, Tom Mead, Howard Goldstein, and George Keding. With that kind of talent, it is no wonder that it is such a great program.

This is truly a four star program, (* * * *, count 'em, 1, 2, 3, 4!), and every ADAM CP/M user should have a copy. The documentation is excellent.

UPDATE NOTE: The new revision LT29.COM is released, and it is even better than LT28! It will also decompress LZHUF encoded text. Like LT28, it is very easy to use. I recommend it over LT28.

This list of CP/M programs contains only a few of the programs that work perfectly on your ADAM. Some obviously rate higher with me than others, but if you see one on this list that you haven't tried, by all means check into it.

Thomas J. Keene
IKAUG



ADam-INFINITUM (Misc. Information)

by Richard Lefko

What you are about to read is a compilation of little known and well known facts about ADAM, the system, and its software. Personally, I take no credit for "discovering" any of what you are about to read. In fact, most of these "discoveries" probably happened by accident, or by the efforts of dedicated ADAM "hackers".

The following information was culled from ADAM newsletters, contributions by fellow users and "messages" from a power greater than mere mortal men! (No, not Barry Wilson).

If indeed we can continue to upgrade and print future ASG issues on a regular basis, (maybe every two years or so), I will need as many of these tips, tricks, and hints as you can send me! Please share your information by sending them to me.

Richard Lefko

(Find addresses in the "IMPORTANT NAMES AND ADDRESSES" CHAP.)

Special thanks to the following who helped make this chapter possible: PJ Herrington and the MOAUG newsletter, (Metro Orlando ADAM User Group); NIAD, (Northern Illiana ADam user group; ECN, (Expandable Computer News, which is no longer available); PSAN, (Puget Sound Adam Network), and John Harris.

I make no guarantees about the "facts" you are about to read. Many of these "facts" are untried by me personally, so I cannot readily attest to their accuracy.

Before attemping to make ANY electrical modifications to your ADAM system, always unplug your unit FIRST.

Also, you should always leave work that may be "beyond" your level of expertise to those qualified to perform it.

I have made an attempt to group these items into 3 general sections. These are: GENERAL INFORMATION, SMARTBASIC, and SMARTWRITER, in that order.

Without further adieu, I proudly present Chapter 18:

**********"ADam INFINITUM"**********

GENERAL INFORMATION

o In "computer talk" some of which you may run into in this copy of ASG:

A "BIT" is a binary element, electronic, (or sometimes magnetic), in nature. It is either "on" or "off", "true" or "false", "present" or "absent", "1" or "0", etc.

8 bits make a "byte". If all bits in the byte are "0's" then the value of the byte is 0. If the bits are all "1's", then the value of the byte is 255. You figure out the rest.

256 bytes make one "page".

4 pages, or 1024 bytes makes one block; commonly referred to as "one K".

Thus a "64K" memory expander contains 64*1024=65536 bytes.

o the symbol "^" is used to indicate "control" as well as to indicate a "power". Thus it is that "^S" means the "control" key and the "S" key, (being depressed simultaneously for example); and X^2 means X times X, or "X squared".

o ADAM's operating system was developed by Infosoft, and is labeled I/OS.

o The ADAM printer was manufactured in Northern Ireland.

o If you have a disk drive you must turn it on before ADAM in order for ADAM to recognize it. (Using one master switch for the whole setup works just fine too).

o The original ADAM disk drive was manufactured by Micro Peripherals, Inc. (M.P.I.)

o If you have an ADAM disk drive, you won't forget to remove a disk at the end of a work session if you place a small strip of fluorescent tape on the upper lip of the disk door. The tape will only be visible when the door is down. When looking at your "shut down" system as you put all tapes, disks etc. away, see if you can see the tape; if not, close the door.

o To increase the life of new printer ribbons, store them in the refrigerator. However, you should wait about three

ADAM will now stop printing after each record allowing you to change the envelope, paper, etc.

- DISK MANAGER will only "run" software that would normally run if the reset button were pulled.

- ADAM user upgrades of the DISK MANAGER have installed routines for printing from Smart WRITER, etc., on a dot matrix printer. These variations also allow double wide, compressed, sub/superscripts, etc., for the DM printer. Contact your user group for more information.

- The ATARI defender cartridge game does not work properly on an "ADAM stand alone".

- Data packs, with one directory block, will only store 35 entries. Each additional directory block will allow 39 more file entries.

- To check the revision of just about any original COLECO software, hold down the control key and press the "R" key just after booting. Version 15 is good for DISK MANAGER, 27D for SMARTFiler, 12 for ADAMLink, 5 for AUTODIALER, and 14 for RECIPIE FILER.

- If you were never able to purchase an original dust cover for your ADAM, try a VCR cover. A second one will take care of your keyboard and disk drives.

- Digital data packs look very much like audio tapes, but that is where the similarities end. There are important differences so do not try to use audio tapes in place of Digital Data Packs. In particlar, "BLOCK NUMBERS" are written on DDP tapes.

- To convert an audio tape to a an ADAM DDP, use the "MEGACOPY" hardware/software device, by Syd Carter of Canada.

- Unplug your ADAM power supply, disk drives and any other electrical components when a thunderstorm approaches. A surge suppressor is recommended. A near-miss lightning strike will cause a power surge in the lines that can jump or "fry" even an "open" electric switch.

- To view the "secret screen" in ADAMCalc, load ADAMCalc, and when the screen asks if you'd like on-line help, don't answer. Instead, press the "up" and "right" arrow keys at the same time; then type in the word, surfnazi, all lower case, no punctuation. You may need to try it a couple of times.

- If you have two Digital Data Drives and opening the door to one causes the second to pop open, you probably installed the second one a little crooked, and the second door is hours after removing a ribbon to use it.

- Locking up of the entire system or getting strange lines across the screen may be a sign of heat build-up. Buy a small fan to keep air moving around your ADAM.

- It is recommended that you occasionally, (with the power off), disconnect and reconnect all of your cables to be sure they are making a good connection.

- If your disk drive power transformers quit, try either TRAK or ATARI part number C017945 transformers, these seem to work fine.

- Switching to MANUAL RECALC while using ADAMCalc makes the program work more quickly.

- Sometimes placing aluminum foil under a television that's being used as a monitor will cut down on interference.

- ADAM's CP/M 2.2 was written by Digital Research.

- ADAMCalc was written by Lazer Microsystems.

- There is a special set of questions about the authors on the public domain JEOPARDY game tape/disk. To access these questions do the following: After booting your media and getting to the point where it asks whether you are using a question pack, hold down the control key and press the "up" arrow key, then the "right" arrow key, followed by the "down" arrow key and finally the "left" arrow key. The special questions will then be loaded.

- If you load a defective Data Pack and the drive just keeps turning, don't turn your ADAM off, just pull the CARTRIDGE RESET switch.

- If you load a defective disk and the drive just keeps turning, don't turn your ADAM off, just remove the disk.

- If your daisy wheels need cleaning just soak them in 91% isopropyl alcohol, (rubbing alcohol), for 5 to 10 minutes then wipe with a paper towel and air dry.

- If a data pack fails to read or write properly remove it from the drive, place it in the palm of your hand and gently slap it down on a flat surface. Then try to read from it again. This sometimes straightens out the tape on a reel, and this sometimes clears up the problem.

- To print out only one record at a time from a SMARTFiler list of records, (i.e. mailing labels or envelopes), try the following: When creating your format in SMARTFiler add carriage returns until you can't add anymore, (ADAM buzzes); move your cursor up two lines and enter a period.

rubbing against the first door. Loosen the mounting screws and move the right drive to the right. If not fixed, move the left drive to the left.

o FILE DIRECTORIES:
The EOS DIRECTORY is in block 1 etc. The number of blocks to reserve for the directory during the INIT process can be specified as any value from 1 to 127. (See Chapter on "SMART BASIC"). EOS directory entries specify the exact block number of the beginning of each file, and the length of the file. Thus all blocks of that file are consecutive.

o THE CP/M DIRECTORY is in block 13, and the block numbers of each file are added to 13 in order to get the actual block number where the file can be found on the media. The block numbers are all listed in ther directory under the filename in the order in which the data was written to the media. Therefore the first block of the file might be on block 14, the second on 43, the third on 27, and etc., thus making the use of media space much more efficient than that of the EOS directory.

o THE TDOS DIRECTORY is found in media block 13, 14 etc. The number of blocks reserved for the directory depends upoo the size of the drive in which it is used. The method of deriving the actual block number of a file on the media, follows the same pattern as that of the CP/M directory, but large drives use a factor of 2. In other words, when a directory block is determined, it actually means that block number and the one following. This makes more efficient use of directory space, than that of CP/M.

o In CP/M pressing a SHIFT and the UNDO key will turn the SmartKEYs at the bottom of the screen off. A repeat of this keypress combination will turn them back on.

o T-DOS, replaces CP/M and makes it a lot more user-friendly than the original CP/M. (See T-DOS chapter in this ASG).

o T-DOS will utilize memory expanders of any size available to ADAM, and will print directly to ADAM or a dot matrix printer, and will address any disk drive or hard drive connected to the ADAM, regardless of the sizes therof.

o Several originally planned ADAM-CP/M programs have been converted to run on TDOS on the ADAM. Wordstar 4.0 is one of the best; and one who uses WS 4.0, will return to SMART WRITER only out of dire necessity.

o The software that comes with the ADAMLink modem, (ADAMLinkI), does not support up/down loading. However, there is an upgrade called ADAMLinkII which does support up/down loading. Most user groups can supply you with a copy of ADAMLinkII.

o Modem programs that are much more advanced than ADAMLinkII are presently available for ADAM. For more information see the chapter on "TELECOMMUNICATIONS AND BBS'S".

o Advanced modems are available for the ADAM. Contact your user group, and check the advertizing in this book for more information.

o When transferring a SMART WRITER file to T-DOS or CPM, unwanted spaces appear in the text. To remove these, use the SEARCH AND REPLACE function of your wordpocessor. SEARCH for 5 spaces, and REPLACE them with 1 space. Then search for 4 spaces and replace with 1, etc.

o Sometimes when transferring a SMART WRITER file to T-DOS or CPM, unwanted RETURN codes are also found. Wordstar 4.0 can remove these also as well as can some other T-DOS editors. Otherwise they are removed with the "manual SEARCH AND REPLACE" function. ("Manual" means that the user does it with his own "manos" or hands).

SMARTBASIC INFORMATION

o NAMES FOR SMART BASIC. In various conversations and writings amoog ADAMites you will see SMART BASIC referred to by various names. Since BASIC is a system of programming, not by any means unique to ADAM, (SMART BASIC being the name chosen by Coleco for their version), many of these names have been learned by ADAMites from other sources. Many of them are just "thought up" as one talks or writes along. There are only two versions of basic used in the ADAM EOS system, although in the T-DOS-CPM operating system there are several possible, if conversions are made.

SmartBASIC is the name of the basic program that comes with the new ADAM.

BASICPGM, or BASICPGM2 are names derived from the filename for SMART BASIC used in the DIRECTORY of the ADAM BASIC tape.

SMART BASIC Ver2, and variations of that name refer to an advanced version of BASIC which was never released by Coleco, but which seems to work quite well.

".BAS" is the TDOS-CP/M filename extension used in filenames to show that the file is a basic file, but does not necessarily specify the version of BASIC to which it pertains.

BAS is another common shortening of the name, and there are many others.

The above probably reflect the more commonly used names, so don't be confused with the jargon of these ADAMites.

o To find out which revision of SMARTBASIC you have, type in the following: "PRINT PEEK (260)", exactly as shown inside of the quotes, and press return. The number 79 or above

should appear. If not, have it replaced by a user group.

- When programming in BASIC you can use the MACRO symbol "?" instead of typing in the word "PRINT".

- Do not use your original BASIC media for loading BASIC. Use it only for making backup copies. In that way you can feel free to use any of the copies to store your files, saving a lot of media-switching when loading BASIC files and programs.

- If you have two Data Drives, always boot EOS programs from Drive #1 until you become familiar with them. Many programs look for data on this drive. However, your BASIC media may be altered internally to look for the HELLO program on any drive you wish. Contact your user group for information.

- The easiest way to determine if a media is self booting, (self loading), is to place it in a drive and pull the reset. This is called "booting". If it "boots", then it has a "boot" routine installed on block 0 of the media.

- Type "CATALOG" in basic to get a display of the directory of a DDP/DISK.

- A different word, (like "DIR", as used in CPM and TDOS), can replace "CATALOG" to get the directory display in BASIC. This is done by making a temporary or permanent change to your copy of BASIC. "DIR" is so much easier to type that many ADAM users have made the change. With "DIR", the same command is used in BASIC, CP/M, and TDOS. Contact your user group for more information.

- Filetype designations appearing when the directory is displayed in BASIC are: "A"-A BASIC file, "a"-A BASIC back-up file, "B", "b"-These files may be saved in a binary form or these may be SMARTWriter files. "*" means a file is "locked". See the chapter on SMART BASIC for more information about "locked".

- If you find an "B" type file in the DIRectory, and it IS a BASIC binary file, Type "BRUN (filename)", and press "RETURN". If it doesn't run, (and you may get an error message, "UNDEFINED STATEMENT ERROR", at the same time), type in "RUN" and press "RETURN" again. If it still doesn't RUN, then either you are mistaken and it is a SMARTWRITER file, or else it is a BASIC binary data file, which would ordinarily be CALLed to be loaded from within a program for use by that program. An example of the latter might be a file containing an ML routine which one of your BASIC programs uses. See The chapters on "SMART BASIC" and "ML PROGRAMMING" for more details. (I didn't say these would be easy!!!!).

- If you get an error message like, "FILE TYPE MISMATCH", try BRUNing the file.

- Data drive 1 is "D1" in BASIC, data drive 2 is "D2", Disk drive 1 is "D5", and Disk drive 2 is "D6".

- The data drives are designated A, B, C, D, and M when using CPM. TDOS gives the user some control over the names of the drives.

- To turn on the ADAM printer when in BASIC type "PR#1" and press "RETURN", or put a PR#1 statement in one of your BASIC command lines. Any PRINT statements effected after that point will be sent to the ADAM printer. Typing "PR#0", either in immediate mode, or into the BASIC program, will cause subsequent printout to go to the screen only, canceling the effect of PR#1.

- To feed characters to a parallel printer when in BASIC, a routine must first have been installed into your BASIC program, (preferably on the media). It is generally designed to operate with the "PR#2" instruction. With it installed, and a parallel printer attached through an appropriate interface, type "PR#2" and press "RETURN", or put a PR#2 statement in one of your BASIC command lines. Any PRINT statements effected after that point will be sent to the parallel printer. Typing "PR#0", either in immediate mode, or into the BASIC program, will cause subsequent printout to go to the screen only, canceling the effect of PR#2.

- If a program asks you to input a specific keypress, and nothing happens when you do; check to see if your caps lock is on. To turn off the caps lock from within a BASIC program, (in essence avoiding the possibility of occurance of this problem), write "POKE 16149,255:POKE 16150,255:POKE 65220,2:POKE 65220,128". See the chapter on "HANDY INFO - PEEKS AND POKES".

- When programming in BASIC and using line numbers with 5 digits, there is a problem in that the cursor comes up on the screen under the second of the five digits. So if you want change the line in any way, you can only retype the entire line. There are three ways to overcome the problem:

  The first is to press "HOME", and then run the cursor down the left column to the desired line and through it to make the change.

  The second is to strart the cursor at the beginning of any blank row and cursor through the whole empty row until the cursor "wraps" back to the frist column. Then run the cursor to the line number, and mke the change. (If there is no blank row, the cursor may be moved via the "SPACE BAR" wiping out a printed line above or below the line to be repaired).

  The third method is accomplished by hitting the

"ESCAPE/WP" key while the cursor is still in screen column 2. This will enter an "ESCAPE" ASCII, (27), in the input buffer at that point, (not visible on the screen). But no matter, because you then move the cursor left one space which removes it from the input buffer. Then run the cursor through the line, making the desired corrections.

- The number of characters permissible on a SMART BASIC command line can be increased by a POKE 12105, xyz instruction. There is some disagreement about the value "xyz". (The default value on original BASIC media is 128). Some believe that it is 239. Mel Ostler has his set at 253, but has never tried the maximum of 255. He has done a lot of BASIC programming and has never had a problem with that number of characters on a line. However, if in the immediate mode he writes something like "PRINT 235.90+123.89+ ... ", until nearly the whole line is full of characters to add, the answer is always some ridiculous value. But just knowing that this is the case solves his problem, and he never enters more than about 128 characters in such a case. So 253 characters remains permanently and satisfactorily changed on his BASICPGM.

- To RECOVER an "h" file, (to make it an "H" file), fix the BASIC bug with a POKE 20619,72. This should be made a permanent fix, as others mentioned above.

SMARTWRITER

- To check the revision of your ADAM's CPU, hold down the control key and type the letter "R" while in typewriter mode. The revision number will appear in the smartkey box onscreen to the left. It should be 79 or better. Contact your user group for information about an upgrade.

- SMARTWRITER was not written to recognize disk drive #2.

- Use a symbol for a long word or phrase you may use frequently in a long report, then use the "SEARCH and REPLACE" function and the "REPLACE ALL" function from within "S and R" to fill them all in at the end. Remember to use a symbol that you are certain of not appearing elsewhere, like @, |, \, ^, zzz, etc.

- Another use for the above mentioned S and R routine would be with long documents. To quickly move to the middle or end of a document, leave a symbol somewhere in that vicinity. Then when you want to move quickly to the area, "SEARCH" for the symbol. The "SEARCH" function moves through the text faster than the usual "HOME-UP/DOWN" arrows do.

- When using SEARCH and REPLACE, especially when searching and replacing many spaces with less spaces, (like is often necessary with a file that has been transferred with ADAMCALC), an error message at the end of the operation will often tell you "TEXT NOT FOUND". CHECK YOUR TEXT! More often than not, it did work.

- When using SEARCH and REPLACE to remove multiple sequences of a single character, (for example removing several "space" characters between words), the SEARCH will find a place of occurrence, and will remove and replace the first set, and then it will move on to the next place of occurrence. An example of this problem is shown when several spaces are between two particular words, and you wish to remove all but one space. The screen begins by asking what to find, you press the space bar 2 times to find 2 spaces together, and press SK VI to begin search. The cursor finds the first occurrence of the double spaces, and asks what to replace there. You hit "RETURN" for none, or safer yet you hit the space bar to replace 2 spaces with one. Then you hit SK VI to do all occurrences. The program moves the cursor to the location of first occurrence and removes 2 spaces and places 1 space. If there is more than 1 space remaining in that same spot, it does not continue operating there, but moves to the next occurrence. Thus it is necessary to re-do the operation several times. The process can be accelerated if the first time you remove say 4, and replace 1. The second pass remove 3 and replace 1, etc.

- SEARCH and REPLACE will sometimes deposit the characters sought at the end of the file. Check the end of your file after using!

- "SEARCH" only works top to bottom, so start with the cursor at the top if you wish to search the whole file.

- SEARCH and REPLACE will not remove carriage returns, nor the last space between words.

- SEARCH and REPLACE will quickly move you to the end of a long file if you have it search for a character or series of characters that are not in the file. (You can ignore the error message at the end of the movement, you just wanted to get to the end of the file anyway!)

- There have been MANY "FIXES" for our famous "line and 1/2" bug in SMARTWRITER. If you are not aware of the problem, then simply put; for every empty line in your document, (double spacing), the ADAM printer will "return" a line and a 1/2, which is why printing multiple pages presents such a problem in top and bottom margin alignment. There are three fixes suggested.

  First, instead of a simple "RETURN" symbol typed to the "empty" line, type a symbol from the keyboard which does not appear on your ADAM printer's daisywheel, and then type the "RETURN" symbol. If there is no such missing character,

then remove one that you will never use from the daisywheel, and use that character thereafter. This fix does not work with a Dot Matrix printer.

Second, is to put a "." on the first column of the empty line instead of a non-printing character, and then if necessary for appearance sake, white it out after printing.

Third is the most simple. When you make an empty line, hold down the control key and press the number "6", then release both and press the spacebar. This will leave a character that looks like an upside down "L". This character will not print and the SMARTWRITER printer will only make one line empty instead of the 1 1/2 lines. (Pressing Super/Subscript, Subscript, RETURN will accomplish the same end result).

o Writing and proof-reading is easier to do if you change the screen to "MOVING WINDOW", and set the right margin to 45. Then everything is on one screen and you can also cursor through much easier. Change the screen back to print.

o Store a document early on, perhaps after typing only one character. Then clear the workspace and load that same program. In this way SMART WRITER will know the name of the document in the workspace, and you will not have to supply a name every time you do a "save it so you don;t accidentally lose it". (And as mentioned below, this should be done often).

o CLEAR SCREEN eliminates the filename of the file on which you are working, no matter how much data was cleared. Thereafter SMART WRITER does not consider your work as the same file as the one you loaded. So when you attempt to STORE your document SW will demand a name, and the name will have to be different than the original name. So use a new name, but with a mnemonic reminder that it is a subsequent file to the first, (like "Suzy1", when the first was "Suzy"). Then later ose BASIC to "clean up" the DIRECTORY.

o Store and re-store your document frequently so if your ADAM should lock-up (AND IT OFTEN DOES!), or the power fails, you won't lose very much of what you were typing.

o Do your long SMART WRITER documents io smaller sections. That makes functions like "INSERT" work much faster, and if there is a lock up, you don't lose as much. Then, when each section is finished to your satisfaction, "CAT" them into one file by loading them consecutively, and go ahead and print the files. If you save that long file, you may want to delete the shorter files.

o You can clean up your directory, and recover lost media space by loading files from the original media one at a time, and then re-storing them to a new media. Then INIT the old media for new use.

o Possible lock-ups: Pressing the "BACKSPACE" key and "UNDO" keys at the same time, adding an "END PAGE" marker at the end of a block of text, trying to "INSERT" text at the end of a block of text, getting a "NO MORE ROOM" message when trying to STORE, pressing the "STORE/GET" keys too rapidly after one another, or in fact, tapping any special function key very quickly.

o Sometimes system lock-ups may be relieved by removing and then replacing the keyboard cable connector either at the console or at the keyboard. It doesn't work often, but it is simple enough to warrant giving it a try.

o In some cases, when the attempt to store to a full media gives the media-full message, and makes the line marker on the left go up and down forever; sometimes, (and I accentuate the "sometimes"), after about 15 minutes the program will find itself and return the control to you. If that happens, check your document. It will probably be OK.

o The "TAB" and "SPACE BAR" will put blank spaces into your document. The "BACKSPACE" key will erase them, dragging whatever character the corsor has trapped along with it. This is also a good way to to DELETE small sections of text.

o Store and print in that order, NEVER print first. Many lockups occur when trying to print, but only when printing to the ADAM printer.

o Store important data on two different disks or datapacks, and save one in a very safe place. Especially good are metal enclosed areas like a metal file box or a small safe.

o Don't try to print anything with the margins set at "1" and "80". It will not look right.

o Time your printing for when you need a break, partic..arly when using the ADAM printer. Leaving an ADAM printer printing alone GUARANTEES a reprint.

Well, I hope you've enjoyed reading these tips, tricks, and hints as much as I enjoyed compiling them. These are only a very small sample of what is known, perhaps you know some I haven't mentioned? Perhaps yoo've discovered some yourself? I urge you to write me at the address in the beginning of this chapter and share your exploration with other ADAMites, (Did I mention we're called ADAMites?).

Remember, ADAM means SHARING!

Please support your computer and perhaps we can come up with ASG, BOOK 2!! (Just when you thought it was safe to read BOOK 1!!)

Richard Lefko

THE BEST OF AIM

by Terry R Fowler

SmartFILER - Allows up to 1000 records, each with 32 fields, of which 4 may be designated as searchable.

SmartWRITER - Deletion of a file does NOT delete the stored material. It marks the directory entry for the file as "DELETED", and this erases the entry name from the directory menu. When the directory block(s) on the datapack or disk is(are) full, no more files may be stored EVEN when plenty of room exists according to the "BLOCKS LEFT" information displayed using SmartBASIC.

The 160K DISK DRIVE was originally sold for $289. MODEMS originally sold for $100, ADAMCALC sold for $75, CP/M2.2 sold for $80, as did SmartLOGO.

Versions of SMARTFILER before Revision 27d will not sort more than 255 entries. To see your revision number, after the program loads and SmartKEYS are displayed, press the CONTROL KEY and the "R" KEY together. This also works on SmartWRITER, (R79 or R80); ADAMLINK, (R12, R12X12, R13X15 depending on whether you have ADAMLINK II, III, or III+); DISK MANAGER, (15.0); after the system is first powered up. A block will be displayed onscreen which lists the revision number of the Software. In SmartBASIC V1, type "? peek(260) to see your revision - 79.

DEATH SPIN - SmartWRITER begins a loop, (indicated by the cursor row pointer on the left side of the screen scrolling down time after time); when certain events are encountered while storing a file.

If at first the "NO MORE ROOM" message is displayed, and then an old file is DELETED from the menu to provide space for storage; when the file is then saved it will attempt to store the file and then RESTORE the original data while displaying the message, "RESTORING FILE." The spin may continue for 10 or 15 minutes ending with control being returned to the operator, or the ADAM may freeze and require a reset --- loosing all of the text in the workspace. This is the single most encountered BUG in SmartWRITER.

SmartWRITER will place a space and a half on any line with only the RETURN symbol. A non-printing character can be placed in front of the RETURN to overcome this problem. Try using the CONTROL KEY and "6" together before the RETURN. Although you can see the symbol onscreen, it will not print and its being there resolves the 1 1/2 space printer problem.

IF the folllowing conditions exist:
You want to place a RETURN symbol in the text, (where ordinarily the INSERT function would be required), and
it happens that the place to put the RETURN symbol lies at the end of a line of text as shown on the screen, (that is, just before the "WRAP" takes place for the next word):
and when you press "RETURN" you hear a Buzz and no symbol appears.
THEN, rather than use the INSERT function (which is quite time consuming),
just go to the end of the line as indicated on the "screen position indicator" along the top of the screen, and
press the backspace key one time. Then
move the cursor left to the place where you want the RETURN symbol, if the BACKSPACE operation did not put the cursor there already), and
press "RETURN". The RETURN symbol will appear.

UNDERLINE BUG - Problems occur when you reset your left margin to 1 and begin the line with an underlined word. There is no fix other than to set the margin at 2 in this situation. (The use of a left margin of 2 is not a bad habit have in any case).

SmartWRITER will not recognize a disk drive unless power is applied to the disk drive FIRST, before turning on the ADAM System. This may be remedied by turning the drive on, then pulling the "RESET" switch.

SmartWRITER will not recognize a SECOND Disk Drive because the software was not completely written. The information needed at the time was not available.

SmartWRITER will "freeze" if the ADAM PRINTER Platen and gear assembly jams. Generally a high pitch tone from the printer indicates a problem. Rolling the platen back and forth will free the jam.

APPLESOFT and SMARTBASIC are only compatible insofar as the syntax of the words used in the command language are concerned. However, many programs contain more than just Command Words (like LIST or GOTO). The memory locations at which the execution of each command takes place are

completely different.

INITIATING a disk will not allow 255 blocks of storage space even though the disk directory shown by a CATALOG command may so indicate. To properly INIT your 160K disk, type this first (in the SmartBASIC immediate mode): POKE 25305,160 followed by a press of the RETURN KEY. Then go through the INIT procedure. (See the chapter on "SMART BASIC" for details on INITing other size disks).

Transferring SmartWRITER text files using ASAMCALC will probably result in the file having gaps throughout the document. This occurs due to the way SmartWRITER "word wraps" each line. Those spaces are created because the file is saved or stored with the spaces at the end of each line. Editing may be required to remove the unwanted spaces.

When you INITialize a media in BASIC, the old directory is stored in block 0. If the INIT was done in error, and the user wishes to recover the directory before any new programs are stored on the media, a utility program can be used to restore the old directory back to block 1, returning the datapack back to its pre-INITed form.

When a media begins to wear out, the DIRECTORY area located in block 1 is the area of the media to first begin showing signs of trouble, (since it is the most used portion of the media). The dreaded message, "CANNOT ACCESS THIS MEDIA" appears when you attempt to GET or STORE a file, and only repeated attempts may provide access. Immediately make a backup copy before it is too late!

When a specific FILE on a Datapack cannot be ACCESSED, editing the directory can recover at least part of the file. The procedure works b changing the length of the file just prior to the file named, (in the directory in block 1), so that when the file loads it will load all information specified according to the length. It will be necessary to delete the first file information, some codes or garbage, and possibly retyping a portion of the document.

When revising a SmartWRITER File and storing it, the first version of the file becomes a BACKUP FILE on the datapack. If you use the CLEAR SCREEN COMMAND to eliminate unwanted text, the file name information will ALSO be deleted so that attempting to store the file will result in the message, "FILENAME ALREADY EXISTS".

SEARCH (in SmartWRITER use) will not search beyond any END PAGE MARKER used in your document.

To quickly reach the end of a long document, use the search command while searching for "###", or some other symbol that you are sure doesn't appear in the text.

PRINT HEAD - If your ADAM PRINTER head goes to the right, or if it beats against the side of the case on the left, the problem is in the REED SWITCH located either on the printer head or on the left side of the case. It can be cleaned or adjusted with small bends (contacts should be closed in the "normally closed" position). (See the Chapter on "ADAM SERVICE AND REPAIRS" in this ASG) .

When editing files or writing BASIC programs, save your material often to prevent possible loss.

Break large SmartWRITER documents into small "chapters" or sections. When you are ready to print, load, (append), all files into one file, and then re-SAVE.

In SmartWRITER the controller keypad can be used to input numbers into memory and the joystick can be used to move the cursor.

With multiple block DIRECTORIES, SmartWRITER will display the first part of the directory, (actually the first 30 entries). To see the rest of the directory do the following: Move the ARROW across to the top left name, (it should be there already); press the UP ARROW KEY (which moves the ARROW to the Botton Left name), move the ARROW across to the botton right name, press the DOWN ARROW KEY. The drive will run to load the second part of the directory.

To create your own 2 BLOCK DIRECTORY, Poke a 2 into location 25300 (POKE 25300,2 followed by the RETURN KEY). Then INIT your fresh datapack. (See chapter on "SMART BASIC" for more details).

SMARTBASIC, (the original on datapack), may be transferred to DISK using many copy utility programs (block numbers 0 - 29 are all that is necessary for the transfer). However, SmartBASIC is CODED for use only with the tape drive. To change the code for DISK #1 use, EDIT BLOCK #18 on the disk, the second byte (88) should be changed to 84. For disk drive #1 it is coded 85, for Datadrive #2 it is 24, and for disk drive #2 it is 86.

SmartFILER 27d has a bug which improperly prints the spacing for labels. It also prints as extra line between records, wasting space. The problems have been corrected, and the corrected program is available by sending your original datapack to Adam's House with $5 for recopying. (See paid ad inside back cover for AIH).

If you wish to edit your own copy of SmartFILER to solve the problem described above, load block 18 and change byte F8 on page 3 from 02 to 01 (using Edit-Block). (See chapter ADam INFINITUM for definition of "page" etc.).

One problem encountered when using SmartFILER to print

multiple copies of letters or envelopes with the ADAM Printer, is that the printer will not pause long enough to allow you to change the paper. The trick to give you that extra time is to press the "F1 STOP PRINT" SmartKEY, JUST BEFORE it pauses normally. It will stay paused until your press PRINT.

Another problem with the use of SmartFILER arises when trying to print columns and rows of information uniformly in line. When typing in your field information, insert CONTROL "q" characters (press the CONTROL KEY and "q" key together) according to how you wish to align the data. These characters will not print (even though you see them onscreen), but will maintain spacing when printing your data.

Although SmartFILER has four searchable fields, you may find occasions when more searchable fields would be desirable. Use the searchable fields to code letters separated by commas and you can then search in MANY ways. For example, M could stand for member, N for nonmember, X for exmember, and groupings could be sorted by simply searching for these coded letters in one field. If you want alphabetized listings, try using INDEX first before searching a field.

BINARY files are created in SmartBASIC using either the program "cruncher" or the program "TURBOLOAD". The resultant binary files use the "M" filetype designation in place of the normal "A" type as displayed when you type "CATALOG" to bring up a display of your directory. The advantage of binary files is that they load ten times faster than a BASIC text file. Use the terminology: "BRUN filename" instead of "RUN filename."

One bug found when trying to RECOVER an old version of a binary file is that when the newer version was saved, the old version filetype is changed from "M" to "B", and the command RECOVER cannot bring back the "B" type file. To correct this, type (in the immediate mode): POKE 20619,72 followed by the RETURN KEY. Now you may recover those backup "B" files. (To make permanent changes to your BASIC media, see the chapter on "HANDY INFORMATION - PEEKS AND POKES).

BINARY PROGRAMS may load but not execute; giving an error message instead, "ILLEGAL FORM OF OS COMMAND", or some other error message. This is a normal BASIC bug, and doesn't always happen. Simply type "RUN" and press the "RETURN" key, and the program will execute.

DATA & REM STATEMENT BUG - In SmartBASIC everytime you load and resave a program, BASIC places an extra space at the beginning of DATA and REM statements, eventually pushing data off the end of the BASIC command line. Temporarily correct this bug by typing: POKE 15824,216: POKE 15830,0: POKE 15831,55: POKE 15832,19 followed by a press of the RETURN key. (To make permanent changes to your BASIC media, see the chapter on "HANDY INFORMATION - PEEKS AND POKES).

MERGING SMARTBASIC PROGRAMS - There is no merge command in SmartBASIC V1. To merge or load a new program into memory, writing over the same line numbers and filling in new line numbers of the old program, do the following: POKE 6356, 201 followed by a pressof the RETURN KEY. This keeps the "NEW" function from working to wipe out the original program in memory. Return to normal by typing: POKE 6356, 205.

T-DOS or CP/M2.2 FORMATTING - Any formatted disk or datapack may be used with TDOS or CP/M2.2 without FORMATTING with the utility program FORMAT. Simply use SYSGEN to copy the system tracks, (blocks 1 through 12 and the boot block, block 0), to the media from your original or backup CP/M DATAPACK. (See chapter on "easier-to-use" T-DOS for instructions for making a T-DOS system media.

You can INIT PROTECT any medium by first creating a short dummy program, (one line will do). Then type "POKE 23925,2", and press "RETURN", (in the immediate mode). Now SAVE BASICPGM, (BASICPGM is the name of your "dummy" program), to your media. SmartBASIC will NOT initiate any medium with BASICPGM thereon. POKE 23925,65 after you're done to restore the normal SAVE function. If later you decide to INIT the medium anyway, POKE 20435,2 and then DELETE BASICPGM. POKE 20435,65 to restore the normal DELETE function. Now INITIATE normally. WARNING! DO NOT DO THIS ON A MEDIA ALREADY CONTAINING THE REAL "BASICPGM"!!!

SmartBASIC V2.0 is available in different versions. To check your revision number, load Smartbasic V2.0 and type, PRINT PEEK(268) <RETURN KEY>. The latest version is 852.

SmartBASIC V2.0 uses different values for colors in HGR and GR Color Tables. To correct this, type the following: FOR I = 0 to 15 : POKE 25360 + I, I : POKE 25376 + I, I : NEXT I <RETURN>.

SmartBASIC V1 also uses different values for colors in HGR and GR modes. The following POKES solve the problem: POKE 18728, 121 : POKE 18729, 0 : POKE 18730, 0 : POKE 18735, 121 : POKE 18736, 0 : POKE 18737, 0 : POKE 19256, 0 : POKE 19257, 0 : POKE 19258, 0 <RETURN>. (To make permanent changes to your BASIC media, see the chapter on "HANDY INFORMATION - PEEKS AND POKES).

In SmartBASIC, while printing, the screen echos each character onscreen. If this is bothersome, it can be disabled by typing, POKE 12043, 201 (default 245).

SmartBASIC V1 has a bug which prevents you from BRUNning a program from another drive by adding the Dn at the end of the BRUN Statement. This BRUN DRIVE BUG may be eliminated by typing, POKE 21819, 11 <RETURN>. The BRUN STATEMENT LENGTH

BUFFER is too small for use of location, length, and drive suffix. This is corrected by typing the following POKES: 16601,35: 16602,249: 16604, 73: 16605, 249: 19450,249: 19459,34: 19566,72: 19567,249: 19585,35: 19586,249: 19558,73: 19559,249: 19563,73: 19564,249: 19576,73: 19577,249: 19595,73: 19596,249: 21019,11. (To make permanent changes to your BASIC media, see the chapter on "HANDY INFORMATION - PEEKS AND POKES).

The SmartBASIC INPUT LINE LENGTH may be increased to 239 characters and spaces for each line number by typing, POKE 12185,239 <RETURN>.

You can eliminate spaces placed after periods and commas (placed there by the computer) by typing, POKE 13357,0 : POKE 13349,0.

SmartBASIC V1 & V2 have a limited POKE RANGE which may be made "unlimited" by typing, POKE 16149,255 : POKE 16150,255 <RETURN> for V1, and POKE 1648,255 : pOKE 1649,255 <RETURN> for V2.

SmartWRITER CLEAR BUG - To clear the screen or workspace press the CLEAR KEY, followed by the SmartKEY choice, and Final Clear option. Pressing these three keys in rapid succession may cause the system to lock up or loose the sound. And as you type at the end of a line, the characters do not appear until you jump to the next line. At times, the condition will correct itself. Use the CLEAR function carefully.

SmartWRITER VERTICAL LINE SPACING BUG - When changing the vertical line spacing, it may be necessary to do the change twice. Notice whether the pointer moves. If there is no hesitation, the change was not made.

STORING DOCUMENT BUG - As you type a document you should store the text workspace frequently in case of power loss or "SmartWRITER Lockup" problems, (as mentioned above). The name you choose is entered into the directory. Later, you will be required to use a NEW name for your document when you try to SAVE the workspace because SmartWRITER does not recognize that you are still editing the document you SAVEd.

This can be overcome by clearing the workspace after the FIRST SAVE, and GETTING the same file back. Now you can use the same file name as ADAM makes your latest SAVE your primary file, while the previous saved files becomes the backup file. (See "ADam INFINITY" chapter for more discussion).

SMARTFILER can "GET" forms you create using SmartWRITER in order to allow you to type letters and labels in different ways. However, if you use a multi-block directory tape or disk; SmartWRITER will, but SmartFILER won't, access more than the first block of your directory. Use a fresh medium to save your forms for SmartFILER.

SmartWRITER will "GET" a SmartBASIC program, but the line numbers will not be separated by a space from the first entry in the line. If this is bothersome, you can correct this prior to saving your SmartBASIC Program. Type, POKE 24100, 0 : POKE 24101, 0 : POKE 24102, 0 <RETURN>. (The default values: 58, 20, and 63 respectively).

SmartBASIC V1 has a FILE LENGTH BUG - when you delete a large file and save a smaller file having less length, the smaller program will have all the space reserved for it that was previously dedicated to the deleted program. To see the actual number of blocks assigned to a file, first type: POKE 21370, 0 (6 is default) <RETURN>, before you type "CATALOG" to bring up the directory of the medium.

Also, if you wish to see each file's START BLOCK location on the medium, POKE 21370, 2 <RETURN> To see the ACTIVE FILES blocks left on your medium, type: POKE 21298, 0 (default 235) <RETURN> before requesting the directory display.

SmartWRITER documents should never be ended with an END OF PAGE MARKER. Doing so may produce the DEATH SPIN spiral of the pointer. Place a RETURN character after the EOP marker.

Terry Fowler
(See paid ad on inside back cover for ADAM's HOUSE).

HANDY INFORMATION + PEEKS AND POKES

by Guy Cousineau

Following are some handy PEEKs and POKEs which can help you get around some of SMARTBASIC's limitations. They have been organized by category to simplify your search for the correct one. Before dealing with specifics, we should dispense a few definitions.

When dealing with colours, we often refer to the absolute colour table which goes like this:

0	transparent	8	med red
1	black	9	light red
2	med green	10	dark yellow
3	light green	11	light yellow
4	dark blue	12	dark green
5	light blue	13	magenta
6	dark red	14	gray
7	cyan	15	white

Note that colour 0 is often referred to as black but it is not; it lets the border colour, (or backdrop), shine through. When dealing with the default SMARTBASIC screen colour, it gives the appearance of black since the border is black. See the notes on TEXT colours below and try changing only the border colour. You will see that it changes the entire screen colour since characters have a transparent "off" colour.

Several of the memory addresses illustrated show the direct result of a command like COLOR or SCALE. They have been included since they offer you a choice of how you want to change or use a value. For example, you can't ask "what is the default colour value?". Furthermore, ML programers may make use of some of these addresses since it is hard to CALL the COLOR command from a machine language routine.

TEXT

17059	border colour	0-15
17115	normal character colour	16*set+clear
17126	inverse character colour	16*set+clear
159	FLASH speed	
17291	speed of cursor flash (poke 17000,1 disables cursor flash)	
16129	SPEED value	
1145	number of prompts (2 max)	
1146	first prompt character	
1147	second prompt character	
16953	ASCII of cursor	
16955	ASCII of character under cursor	
16954	ASCII of blank space	
17001	current vertical cursor position	
17002	current horizontal cursor position	

All character colours are specified with the set(on) colour and the clear(off) colour. Thus to get white characters on clear background you use 16*15 + 0 (240 decimal). For colour changes to take effect, you must issue a TEXT command.

GR

18607	border colour	0-15
18633	default colour of drawing plane	17*colour
18711	character colour (as text)	
16776	current draw(pen) colour	0-15

HGR and HGR2

25431	border colour	0-15
25471	default colour of drawing plane	17*colour
25568	character colour (HGR only)	
16777	current HPLOT (pen) colour	
16763	current x-axis position	
16764	current y-axis position	
16765	current SCALE value	

You can use the current x-y coordinates to check where a DRAW command has left the pen. It can be moved directly by POKEING rather than a DRAW AT x,y command. I have also discovered a bug in HPLOT which prevents plotting on row 159.

This can be fixed with POKE 25940,160.

MARGINS

	TEXT	SCROLL
LINES	17198	16993
COLUMNS	17199	16994
TOP MARGIN	17201	16958
LEFT MARGIN	17202	16956
RIGHT MARGIN		16957
BOTTOM MARGIN		16959
START SCROLL		16995
LEFT SCROLL		16996

The values in the TEXT column reflect the implemented defaults when you issue a TEXT command. The scroll and bottom margins are calculated by the TEXT command. The values in the scroll column can be user modified at any time; their effect is instantaneous and temporary (until the next TEXT command). While scrolling windows are in operation, it is still possible to use VTAB HTAB to place the cursor outside the window. You can create good special effect with this technique. The scroll values work in TEXT GR and HGR. Remember that the total of 16958 and 16993 must always be 24. Unless you want to create a special effect, the START SCROLL should be the same as TOP MARGIN and LEFT SCROLL same as LEFT MARGIN.

SCREEN FORMATTING

The LIST command sometimes adds annoying spaces which are supposed to enhance the readability of programs. You can remove these by POKEing ZEROes into the following addresses:

13357 after semi-colon
13349 after a comma
13423 after COMMAND word
16140 before a line number in LIST

If you have a 40-column patch, you may have noticed that HTAB is still restricted to column 32. A partial fix for this involves resetting the HTAB margin to 64 with:

```
POKE 26198,63
```

Unfortunately, this will allow illegal HTAB values; use some restraint here. Furthermore, the HTAB routine will perform a screen wrap whenever the value is above 31. It is necessary to re-specify VTAB AFTER HTAB for this patch to work correctly.

When printing tabular data, you can use the COMMA to space out to 1/2 screen or 16 spaces. You can change the comma spacing to 8 with 2 POKES:

```
POKE 7879,15:POKE 7881,16
```

If you print a TAB character (CHR$(9)), BASIC moves out to the next multiple of 4. You can change this to 8 with:

```
POKE 12329,7:POKE 12333,8
```

Both these format changes can really improve tabular printing, especially if you use the 40 column screen.

FILES ETC

Do you want a MERGE command? Follow these steps:

```
LOAD program 1
POKE 6356,201
LOAD program 2
POKE 6356,205
```

Want to be able to recover 'h' files? Simply:

```
POKE 20619,72.
```

You can modify the output of the CATALOG command with the following:

POKE 21298,0 shows usable blocks left, instead of unused
POKE 21370,8 shows actual size of file, rather than reserved size
POKE 21370,2 shows start block of file rather than length
POKE 21405,? where "?" is the ASCII value for the LOCKED FILE indicator

To correctly INIT a tape or disk with any size directory, simply POKE the desired values into these RAM locations prior to issuing the INIT command:

25308 contains the number of directory blocks
25305-25306 contains the size of medium

use	0,1	for tape
use	160,0	for SS disk
use	64,1	for DS disk
use	208,2	for 720K 3 1/2 inch disk

When saving a file to disk/tape, BASIC removes extra spaces and changes PRINT to "?". While this conserves storage space, it makes for an unpleasant display to some programmers if they subsequently use SMARTWRITER to print the file. This can be overridden with the following POKEs made just prior to saving the file:

```
POKE 24100,0:POKE 24101,0:POKE 24102,0
```

After the file is saved, you should reset with

```
POKE 24100,50:POKE 24101,20:POKE 24102,63
```

OTHER PROGRAM CONTROLS AND INFORMATION

RAM LOCATIONS	WHAT YOU FIND THERE
260	revision # of BASIC, (260 is most current)
12185	Max length of program line (max 239 for immediate mode math calculations, or possibly as high as 255 otherwise)
12374	ASCII value of INSERT (^N)
12375	ASCII value of DELETE (^O)

16091-92 number of program lines
16095-96 current LOMEM
16126-27 line number for ONERR
18307 ASCII of CLEAR (^L)
16134 ASCII value of break (^C)
16135 ASCII value of pause (^S)
16136 PAUSE flag (set zero to force pause)
16140 ASCII used to indent line
16149-50 POKE limit; put 255,255
16170 number of digits on float output
16641 current drive (1, 2 5, 6)
16821 current device (0, 24, 4, 5)
17000 current graphics mode
0=text 1=GR 2=HGR 3=HGR
17302 (and 18320, must change both), ASCII of "PRINT SCREEN", (^P)
17950 bell frequency (1)
17954 bell frequency (2)
17958 volume of bell
17963 duration of bell

PRINTER

You can underline characters by sending <character><backspace><underline> but BASIC counts this as 3 characters and thinks you have reached the right margin before you actually have. The trick is to tell BASIC that the printer has a wider margin with POKE 16176,255. Remember to reset the margin when you are done with POKE 16176,80.

You can reset the printer with CALL 64662. This clears any outstanding characters and resets the print head to column 1.

Sometimes you may wish to turn off the screen echo while sending data to the printer. This is done with:

POKE 12043,201

After printing, turn screen echo back on with:

POKE 12043,245

KEYBOARD

Have you ever run a MENU DRIVEN program which does not work because you accidently hit the LOCK key? Prevent this from happening by unlocking the keyboard from your program:

p=PEEK(65220):POKE 65220,2:POKE 65220,p.

The keyboard can also be reset with CALL 64659.

Following is a list of keyboard codes for the special keys. Consult an ASCIII table for control and regular values:

KEY	UNSHIFT	SHIFT	CONTROL
BACKSPACE	8	104	8
TAB	9	105	9
2	50	64	0
[	91	123	27
\	92	63	28
]	93	125	29
^	94	126	30
6	54	95	31
HOME	128	128	128
I	129	137	129
II	130	130	130
III	131	139	131
IV	132	140	132
V	133	141	133
VI	134	142	134
WILD	144	152	144
UNDO	145	153	145
MOVE/COPY	146	154	146
STORE/GET	147	156	146
INSERT	148	156	148
PRINT	149	157	149
CLEAR	150	158	150
DELETE	151	159	127*
UP	160	160	164
RIGHT	161	161	165
DOWN	162	162	166
LEFT	163	163	167
UP/RIGHT	168		
RIGHT/DOWN	169		
DOWN/LEFT	170		
LEFT/UP	171		
HOME/UP	172		
HOME/RIGHT	173		
HOME/DOWN	174		
HOME/LEFT	175		

Codes which cannot be generated:

135 136 176-183 186-255

HANDY CALLS

Following is a description of handy SmartBASIC system calls. These may be particularly useful for machine language programs which want to make use of some of SMARTBASIC's routines to reduce the size of an ML utility.

26163 FLASH on
26141 INVERSE on

26151 NORMAL on
11090 Clear screen and home cursor

14112 SCROLL SCREEN. Leaves cursor in present position but scrolls screen up one line.

64572 WAIT 33 microseconds
This is part of the cold boot routine which waits for the system to reset. The wait value is just barely a "blink", but can be changed to a full 1/2 second with:

POKE 63844,255:POKE 63845,255

You can further increase to several 1/2 seconds with

POKE 63842,x

where x is the number of 1/2 seconds desired.

17209 GET CHARACTER
Flashes cursor and waits for a keypress; character is returned in the accumulator

11865 CHECK FOR LETTER
This routine will check for a-z and A-Z without doing case conversion. The carry flag is set if character in accumulator is OK.

11885 CHECK FOR NUMBER
Checks that value in accumulator is in the range of ASCII 0 to ASCII 9. If the carry flag is set on return, simply subtract ASCII 0 to convert to an absolute number.

12110 PRINT MESSAGE
Prints length-encoded message pointed to by HL.

11194 PRINT CHARACTER
Prints character in accumulator to the current output device interpreting control codes like BELL or BACKSPACE.

12128 PRINT <CR>
Sends <CR><LF> to current output device.

12420 PRINT TO SCREEN
Prints character to screen even if FILE WRITE is active. This can be handy to echo messages to screen during I/O.

7866 HL*DE
Multiplies 2 integer values. The result is returned in HL and the carry flag set if there is overflow.

54272 LAST CATALOG READ
PEEK into this area to view the complete directory from block 1, and uncover information that the CATALOG program did not report. This presumes you are familiar with the directory structure.

55296 LAST BLOCK READ/WRITTEN
The last 1024 bytes read or written to tape/disk will be stored here. You can PEEK into here to analyze what was read.

63599 WARM BOOT
This will perform the same function as pulling the reset switch. If no disk or tape is present, it will fall into the exit to SmartWRITER.

63606 BOOT DISK ONE
This alternate boot will wait for a disk to be inserted in disk drive 1 and proceed to boot it.

64148 EXIT TO SMARTWRITER
Although several addresses have been quoted, this is the correct one. ("CALL 64743" will send the Z80 microprocessor to the SmartWRITER jump table address, from which it will JumP to 64148).

64809 SPRITES OFF
This handy routine will clear any sprites which may be left on the screen if a program using them exits without clearing them.

64851 SOUND OFF
This one is very handy if a program crashes while a sound is in progress.

64885 LAST KEY PRESSED
This is not actually a routine, but is in fact the location where the Master 6801 saves the keypress in RAM. The Z80 picks it up from this location when the programmer desires to read it. It is useful for reading the keyboard "on the fly" in Basic, so that the user doesn't have to wait until some operation is complete before he is permitted to make a keypress. Or you can check this value until it changes, (as Basic does with the GET command); or wait until a desired value appears.

BDS SYSTEM CALLS

For you machine language enthusiasts, the following is a summary of the most useful operating system calls along with the values that must be in the indicated Z80 registers when the CALL is made. These routines can be used to set up your own machine language utilities which will run independently from SMARTBASIC.

Many of these routines and a great deal of information about the Video Data Processor, and the audio chip is discussed more extensively in the "HACKERS HELPER" series of ADAM

books. Contact the author for more details.

64566 INITIALIZE CONSOLE
B= number of columns
C= number of lines
D= home column
E= home row
HL=pointer to pattern table

This routine does the same kind of work that the TEXT command does in BASIC. It initializes a scrolling region and defines the cursor within that region.

64569 PRINT CHARACTER ON SCREEN, called "CONS_OUT"
A =character
DE=Moves cursor to new xy coordinate, (in DE), if A=28. If A= other screen control character, performs the function requested. If A=arrow ASCII, HOME ASCII, then processes cursor accordingly. Otherwise prints character in A on the screen at the present cursor position.

64614 PRINT CHARACTER ON PRINTER
A=character

64620 READ KEYBOARD
This routine needs no setup. It returns the keyboard character (if any) in A.

64755 READ BLOCK
A =device
BC=0
DE=block number
HL=RAM address in which to store that which is read.
This routine will read 1K from the specified device into the buffer pointed to by HL. If the ZERO flag is set on return everything is fine. Otherwise, the error code is returned in A. All other registers are preserved.

64758 WRITE BLOCK
A =device
BC=0
DE=block number
HL=RAM address
Write 1K of data from address in HL to device; similar to above.

64794 WRITE VRAM
BC=number of bytes to write
DE=address in VRAM
HL=source address in RAM
This routine takes care of the complex job of transferring data to Video Memory. You can use it to update characters, graphics, sprites, etc.

64797 READ VRAM
BC=number of bytes to read
DE=address in VRAM
As above reads data from Video Memory. Use it to analyze what is there.

64800 WRITE VDP REGISTER
B=register to write to
C=data to send
Use this routine to set up VDP registers for the various graphics modes and sprite attributes. Following are the VDP register specifics

1 bit 7 always 1=large VRAM, as in ADAM
bit 6 0 blanks display, 1 enables
bit 5 1 enables interrupts
bit 4 text mode flag
bit 3 multicolor mode flag
bit 2 always 0
bit 1 small or large sprites
bit 0 double-sized sprite flag

2 (pattern name table)/400H
This table is 24 rows by 32 columns or 768 bytes.

3 (address of colour table)/40H
32 bytes reflecting the colour of each group of 8 characters. E.G. patterns 0 1 2 3 4 5 6 7 have the same colour.

4 (pattern generator table)/800H
This table has 8 bytes for each pattern for characters 0 to 128. Thus 2K is required for the table.

5 (sprite attributes)/80H
32 sprites by 4 bytes each requires 128 bytes.

6 (sprite pattern)/800H
32 sprites by 8 bytes each requires 256 bytes.

7 bits 7,6,5,4 character colour in TEXT mode
bits 3,2,1,0 border/background colour

64812 PUT VRAM
A =table number. (0=Sprite Attribute Table; 1=Sprite Generator, (or Sprite Pattern Table); 2= Pattern Name Table; 3=Pattern Generator Table, (or Pattern Table); 4=Pattern Color Table.
DE=starting index into the table
HL=user buffer
IY=number of entries to write

This is a more useful routine than WRITE VRAM. It automatically calculates where a particular table is located and updates the specified entry whether a character, a colour, or an attribute.

64815 GET VRAM
A =table number
DE=starting entry
HL=user buffer
IY=number of entries to read
As above, reads a portion of a table from VRAM. The table numbers are as follows:

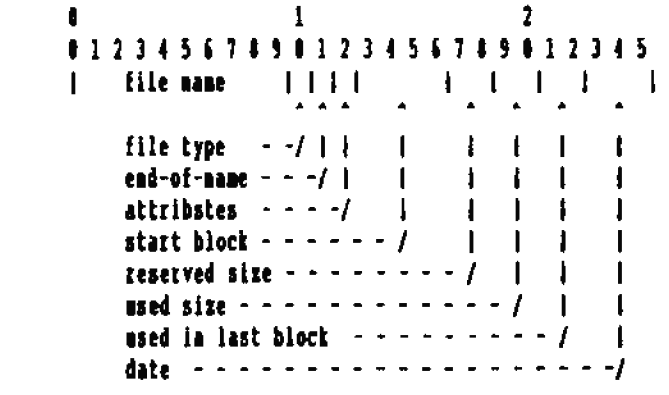
0	sprite attributes
1	sprite pattern
2	pattern name table
3	pattern generator table
4	colour table

64824 LOAD ASCII TO VDP
The only set up required for this routine is to set the VDP registers via the SET_REGISTER routine (64880), so the routine knows where to put the character definitions. It takes care of finding the character definitions from ROM and installs them in the VDP.

DOS DIRECTORY STRUCTURE

Whether using tapes or disks, the DOS treats the media as a sequential device. This means that all 'files' are written to contiguous blocks. While this approach does not take full advantage of available disk space, it reduces the amount of directory information required.

Each directory entry is 26 bytes long, which allows a total of 39 entries per 'K' of directory. The DOS automatically handles the few extra bytes at the end of each block for Directories of more than 1K. Each file entry has the following format:



The file name is limited to 10 characters except the "VOLUME", (the first), entry, which can have 11 characters. The file name, except the "VOLUME" entry name, is followed with the single letter filetype extension; its maximum position, the 11th, or position 10, is shown above. The file type is followed by a CHR$(3), (seen as a "3" when loaded to RAM and PEEKed), which is the signal to the DOS that the end-of-name has been reached. The file type extension, or simply "filetype" as discussed in the DOS system, is located just before the end-of-name. All data from the end-of-name to position 11 is ignored and does not need to be blanked out.

The attributes byte, see diagram above, conveys meaning according to the state of each of the 8 bits contained therein as follows:

BIT SET	Meaning
7--LOCKED:	This bit is affected by BASIC's LOCK and UNLOCK functions which prevent a file from being deleted.
6--WRITE PROTECT:	This bit prevents appending or deleting a file; it cannot be set from BASIC.
5--READ PROTECT:	This bit prevents the OPENing, READing CLOSEing, and LOADing, of files from BASIC or SmartWriter. It can be useful for protecting programs or data that will be loaded in via READ BLOCK.
4--USER FILE:	This bit must be set if the file is to be shown by the CATALOG command. It can however be overridden by setting bit 3. Regardless, setting the user bit allows normal opening, closing, renaming, etc.
3--SYSTEM FILE:	Setting this bit disables the listing of the file by normal DIRECTORY or CATALOG functions. It has no other effect on file operations.
2--DELETED FILE:	A file may be un-deleted by resetting this bit. Make sure, however, that the same file name has not been used elsewhere by an active file, or you may confuse the DOS.
1--EXECUTE PROTECT:	This bit prevents UNLOCKing a file but will not prevent LOCKing. Any file LOCKed while this bit is set will not be UNLOCKable using conventional means.
0--BLOCKS LEFT BIT:	If this bit is set, all other information is ignored along with all

directory entries following it. See BLOCKS LEFT ENTRY for more information.

The START BLOCK bytes identify the start of the file on the media. It uses 4 bytes which are placed in registers BCDE to address, in theory, a drive of over 4000 MEG.

The RESERVED SIZE bytes shows the size of the file originally placed in the "HOLE", a term used by the original EOS programmer to define a "planned" region, or number of blocks, in which to save a file which the user wanted to save. A smaller file may reside in the same hole later, but the RESERVED SIZE or "HOLE" will always be the same amount of disk space. A reserved size may be up to 65535 bytes, (64K), since 2 bytes are used in the directory for this data. Note that the sum of the two quantities, (START BLOCK) + (RESERVED SIZE), must equal the START BLOCK value of the next directory entry for proper management.

The USED SIZE bytes show the actual length of the file. When a small file is placed in a big HOLE, these bytes tell the EOS how many K of file to actually load in when getting the file.

The USED IN LAST BLOCK bytes are needed since the EOS does not use an END-OF- FILE marker in ASCII files. When a file is saved, its exact length in full blocks is computed, and the number of the 'remainder bytes' in the last incomplete block is placed in these 2 bytes. The EOS will know, when re-loading the file, exactly how many bytes of the last block to actually read in. All information on the media beyond the "USED IN LAST BLOCK" pointer will be ignored by the EOS read file routines.

The last 3 bytes of a directory entry are reserved for a creation date. There is a date in the EOS which appears to be the birth date of one of the programmers in 3 BCD numbers YY-MM-DD. There is no function in BASIC, SmartWriter, SmartFiler, or any other COLECO software that I know of that makes use of this date. You may reset the system date by poking the date directly into the EOS, (POKE 64992,year:POKE 64993,month:POKE 64994,day), and all files created that day will have that day's date. Furthermore, jumping to Smart Writer with a JP_HP instruction, or "CALL 64743" will also preserve the system date for directory entries made in the SmarttWriter program. Turning off the computer will obviously erase the date entry, since it is stored by the POKEs in dynamic RAM.

There are four special entries in the EOS directory which look like just like file entries but are used by the EOS to work with the directory and MEDIUM.

VOLUME ENTRY

The Volume entry is set by default to FIRST DIR. This is the name that will be reported by BASIC when a CATALOG command is issued. It is also the name passed by the INIT function in BASIC. Since the volume name does not need a file type, this entry may be up to 11 characters. The attribute byte consists of 80H + the number of media blocks reserved for the DIRECTORY (see DIRECTORY). The next 4 bytes are 55H AAH 00H FFH; these are simply a series of check bytes for the EOS routines to use to see if a media contains a valid EOS directory, (as opposed to a CPM directory, for example, which EOS routines are not designed to interpret). Bytes 17 and 18 reflect the size of the medium, 255 for tapes, 160/320/720 for disks. The other bytes are non-significant and usually zero except for the date which may or may not be filled in as explained above.

BOOT ENTRY

This entry tells the directory how many K have been reserved for a BOOT block. It points by default to Block 0 with a length of 1K and 1024 bytes used. The exact use of this entry is unclear since all EOS media have this entry filled out in the same way. SMARTBASIC and other systems reserve another entry in the directory for a BASICPGM file which is read and loaded according to Macine Language instructions placed at RAM 51200 from the BOOT block. The BOOT entry should not be modified until further study of it is made, although at present, it seems to fill no purpose.

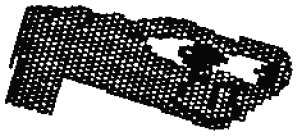
DIRECTORY ENTRY

This entry tells the EOS the size of the directory by the 'size used' information. All other data in this entry appears to be insignificant but should not be changed, just in case. Note that the VOLUME entry also has a directory size, but it only indicates the maximum, or reserved directory size. The DIRECTORY entry reveals how much has been used so that when EOS is ordered to search the directory for a file, for example, it doesn't search "reserved" directory blocks that haven't been "used" yet. To change a directory from 1 to 2K with a utility other than the INIT command with the appropriate POKEs in Basic, mentioned above, both of these entries must be modified.

BLOCKS LEFT ENTRY

The Blocks Left entry indicates the number of blocks available from the last file listed in the directory to the end of the disk or tape. Although it is handled slightly differently by BASIC and BASIC II, it only requires 3

parameters:



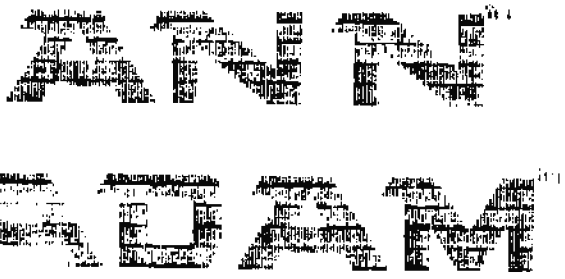
1 Setting the SYSTEM FILE and BLOCKS LEFT bit in the attributes byte means that this is the 'Bocks Left' entry, regardless of the "BLOCKS LEFT" file name. The EOS loaded with BASIC II does not even bother writing "BLOCKS LEFT" in the filename location of the BLOCKS LEFT entry. Neither the standard EOS nor the version used with SmartBASIC V2 looks at the name for any function, but both simply test the attribute byte for bit 0 set.

2 Setting the start block as for any other entry as the sum of previous-file-start and previous-file-size. In other words, if a new file is added it will assume this "start block" value, and this value will be changed in preparation for the adding of yet another new file.

Setting the reserved-size by subtracting the start block from DISK SIZE. If Blocks Left starts at 100, the reserved size should be set to 60 for a single sided disk (not 59).

This information has been gathered through my own investigations and from numerous other sources of ADAM information too numerous to enumerate.

Guy Cousineau



ADAM, APPLE and IBM, RELATIONSHIPS

by Ron Mitchell

From time to time, you'll come across a magazine program listing that looks interesting, and you'll decide to try it out on ADAM.

This sort of exercise can be simultaneously satisfying and frustrating, depending on your knowlegde of BASIC, your patience, and your willingness to see the project through. One thing can be stated with certainty. There's no better way to improve and exercise programming skills than the study of someone else's working program, assembler or BASIC, (warts and all). I've done some of this, and there are a few things I've picked up in the course of such efforts. It seems like this information is worth sharing. Since most of the listings I've found are written in either Applesoft or BASICA, we'll deal with those two.

APPLE

The syntax of Applesoft BASIC is very close to the syntax of SmartBASIC. One of the reasons for which you bought your ADAM, may have been Coleco's claim that it was Applesoft compatible.

To a point, the claim is true, but only to a point. Apples have 40 or 80 column displays. ADAM has only 32 columns, (unless you have an 80 column card, or you're using a 40 column conversion program). Therefore you must beware of HTAB and VTAB commands in an Applesoft program that take you beyond the limits of your screen. (Depending on the application, a considerable amount of reformatting may be necessary. Undertaking this task implies that you have thoroughly reviewed source program flow, and that you know exactly what it's going to put on the screen).

Apple high resolution graphics are written for a screen of dimensions 280 by 192 pixels (HGR2). Again reformatting is required to fit an Apple screen into our smaller 256 pixel width.

Frequently, Applesoft will use PEEK and POKE commands to accomplish tasks for which SmartBASIC has direct commands. For example our command "ERRNUM(1)", (used in error trapping routines), has no APPLE counterpart. Apples use PEEK(222) and you'll see this often in their programs.

Another common discovery for readers of Applesoft programs is that Apple programmers use PEEK(-16384) and POKE -16368 to read and reset the keyboard respectively. Our keyboard read address is 64885, and resetting the keyboard is via a poke to the DCB. (see chapter on SMARTBASICV1 in this ASG).

There are many other Applesoft PEEKS and POKES which Apple programmers use to carry out various functions such as setting the graphics page, ringing the bell, and setting either side margin.

When converting this type of code, you must know what a given PEEK or POKE is intended to accomplish, find the equivalent SmartBASIC command, or POKE or PEEK; and use it instead.

Ken Clark's "Apple to ADAM Conversions" list, has been reprinted herein, to assist you in making those conversions. (See the list immediately following the discussion).

A routine written in machine language, embedded within an Applesoft program, will not work on ADAM. Stay away from routines of this nature unless you're familiar with Motorola 6502 Assembly language and can convert the routine to the corresponding Zilog Z-80 code. The two microprocessors are quite different, and therefore use quite different instruction codes.

FILE HANDLING

Abikoff and Cornell's book "The BASIC ADAM, a Self Teaching Guide", warns of some serious differences in file handling methods between the two BASIC's.

OPEN

For example, our SmartBASIC "OPEN" command does not set the file pointer. In Applesoft it does.

On this, I'll relate one of my own experiences in converting a program where writing to a data file was required.

Using the Applesoft code unchanged, the process worked the first time. When an attempt was made to add data to that file however, the program crashed.

What you must do with the SmartBASIC, is either delete the

previous version of the file, and write a new one; or use the APPEND command. The Applesoft listing had made no such provision, and I had to add additional coding before the program would work.

Applesoft also allows you to OPEN up to 16 file buffers with the MAXFILES command. ADAM has provision for only one file to be opened at a time. This restriction has not been a serious handicap in any of the programs I've tried to convert so far.

BASICA AND MICROSOFT BASIC

IBM's version of BASIC, "BASICA", is noticeably different from both Applesoft and SmartBASIC. There are many unique commands in BASICA. I've not yet tried to convert BASICA's graphics, but even with normal text programs there are plenty of differences with which to contend.

Despite all of this, I have found it easier in some cases to convert a BASICA program to run on ADAM than to convert an Applesoft program. The reason for this might lie in part in the fact that BASICA does not rely very much on POKES and PEEKS, so at least the commands are readable.

If you have Microsoft BASIC to run under CP/M, you'll find that it's a fairly straightforward process to convert an IBM program to run on ADAM. The biggest drawback is again the difference in screen width, 80 columns versus 32. However ADAM's "virtual 80 column screen" under CP/M helps to compensate somewhat, if you don't mind not-seeing the entire layout all at one time on the visible screen.

SOME SPECIFIC COMMAND DIFFERENCES

PRINT USING

In Microsoft BASIC or BASICA this command will allow you to format a column of figures so that they all line up, and so that they have the required number of leading and trailing zeros for the format you are using.

For example if you want dollars and cents, you can so specify with the PRINT USING command. You can even specify a dollar sign if you wish. With this PRINT USING command, BASICA even allows you to add a column of figures with a single command.

We have no such counterpart with SmartBASIC, and neither does Applesoft. It is possible to achieve the same effect with some rather complicated string manipulations and conversion of numerical values to strings, and then back to numbers again.

CLS

Read about HOME in SmartBASIC. In Microsoft BASIC there is neither CLS nor HOME. You clear the screen with a PRINT CHR$(12) command, or if you are really intricate, 24 line-feeds -PRINT CHR$(10) 24 times.

DEFINT A-Z or DEFINT followed by something.

This command defines the variables beginning with the letters in the argument as integers.

In SmartBASIC, there's no need to make such a declaration, but you can save memory by using the % sign after a variable; ie. a% instead of a. The % sign declares the variable as an integer, and thus it requires fewer bytes for storage. (See chapter on SMARTBASICV1 in this ASG for more details).

KEY ON or KEY OFF

Ignore it. All it does is turn off IBM's version of the Smartkeys.

LPRINT or LPRINT USING

Read about ADAM's PR#1.

LOCATE 3,5,0 or LOCATE followed by two or three numbers.

This is the same as VTAB and HTAB, (the above argument numbers respectively). It positions the cursor. The third figure can be either a 0 or a 1 and turns the cursor on and off accordingly. Our POKE 16953,(ASCII value of the symbol used for the cursor) takes care of the cursor for SmartBASIC. (ASCII value = 32 makes it a "space", or blank).

ON ERROR

Same as our ONERR.

INSTR

BASICA and Microsoft Basic both have a way of looking for strings within strings. This command is followed by brackets within which is specified the primary string through which you are searching, the sub-string for which you are searching, and where to start searching in the primary string. It operates in similar fashion to the MID$(z$,3,5) command available in both dialects.

The one application in which I saw INSTR used, was one used to pick out which of a group of function keys had been pressed, and specify branches to the corresponding subroutines. Getting around it in conversion was a simple matter of using logical expressions.

MOD

Determines the remainder of a division operation. We don't have it.

BEEP

This does just what it says. It sends one "beep" to the speaker. If you are envious of this, then in SmartBASIC, you can always specify that "BEEP$ = chr$(7)". Then when you want to BEEP you simply say PRINT BEEP$

DATE$ TIME$

IBM's have clocks that you set on startup if you wish, so BASICA reserves this string to tell you what the date is. If you want the same facility in SmartBASIC, you'll need to define it.

The IBM Character Set

Why there should be any differences in characters between one machine and the next is beyond me. Quite literally, there ought to be a law. But there isn't. The ASCII for the letters, punctuation marks, and numbers, are always more or less the standard set of course, but if you're dealing with ASCII values below 32 or above 126 it's every man for himself.

The "HOME" control character on the Xerox is 26. On the ADAM it's 12. On the IBM it's 11. And that's only one function.

More important however, is that if you look at the IBM character set between ASCII values 169 and 223 you'll find a complete set of graphics characters. This is what enables BASICA to draw those neat screen boxes around the data displays in a given program, and cause it to look finished and professional. There are also numerous accented letters and mathematical symbols in the upper half of the IBM character set. (There is no reason some enterprising ADAMite couldn't design the same set for loading into VRAM on the ADAM, if it were so desired).

There are other differences in commands and features. I have not covered the sound routines, nor have I included some rather obscure things such ad DEF SEG, OPTION BASE and COLOR.

When it comes to file handling, our PRINT CHR$(4); "OPEN", etc., is replaced with a quite different syntax.

OPEN T$ FOR INPUT AS #1 or CLOSE #1.

This doesn't even resemble Microsoft where it's

OPEN "I",#1;t$

CONCLUSIONS

The process of converting a program from one dialect of BASIC to another can be a challenge to say the least. It's often easier, depending on the program involved, to start from scratch and write your own SmartBASIC program to accomplish the same functions as are accomplished by the one you're trying to convert.

In other instances, programs can be easily converted, and can provide some first rate software for a minimum investment in time and effort. One payoff you will certainly derive if you undertake such a task, is the satisfaction of learning exactly how and why a program works and better yet, the discovery of ways to improve it.

Ron Mitchell

APPLE ADAM CONVERSIONS

BY RON MITCHELL AND KEN CLARK

The following information has been provided by Ken Clark, a member of the ADAM User Friendly Group of Ottawa Canada.

Applesoft Basic will quite frequently use a "POKE" value to accomplish various settings and operations for which SmartBASIC has commands. In order to convert an Applesoft program to SmartBASIC, it will be necessary to know what the various poke and peek commands mean, and to be able to set up the corresponding function on the ADAM. The following list should prove helpful.

APPLE		ADAM	
32	Left edge	17202 (1)	Put in actual value
33	Line width	17199 (30)	Number of columns from 17202
34	Top edge	17201 (0)	
35	Bottom edge	17198 (23)	Number of lines from 17201.

NOTE: The following pokes followed by a TEXT command will create a window from lines 5 through 18 with left and right margins of 6 and 25 respectively:

17202=6, 17199=19, 19201=4, 17198=13.
CALL 17197: HOME

will reset the text window and only clear the new window area. Text already elsewhere on the screen, ie. outside the new boundaries will not be erased.

For HGR, the equivalents are: 25577 (1), 25574 (30), 25576 (20), 25573 (3).
CALL 25572: HOME

to clear the HGR text window. The HGR text window can be increased to eight lines by:

POKE 25576,16: POKE 25573,7:HGR

For GR, the equivalents are: 18536 (1), 18537 (30), 18539 (20) 18540 (3).

CALL 18535: HOME

will clear the text window.

APPLE		ADAM	
36	Cursor column	17002 (value is 1 less)	or POS(0)
37	Cursor row	17001 (value is 1 less)	or VPOS(0)

NOTE: POS and VPOS values are always in relation to the text window as defined in the margins and rows bytes. eg. the top row in the window would always give VPOS(0) as one.

APPLE		ADAM	
48	LORES colour	18633	GR window
50	Text format	17006	0=non-flash, 128=flash 63=inverse, 127=flash 255=normal
51	Prompt character	1146	
105-106	LOMEM pointer	16095/16096	
107-108	Start of array space		
109-110	End of array space		
111-112	Start of string space	16111/16112	
113-114	End of string space	16115/16116	
115-116	HIMEM Pointer	16089/16090	
119-120	Line number where the program stopped.	16124/16125	contains pointer to next line number. Current line number is in the four preceeding bytes. The first 2 contain the line number and the second 2 contain the tokenized ad'ss.
123-124	Current data line number.	16117/16118	
127-128	Input data address		
129-130	Last-used variable name.	16107/16108	Contains the next variable name/add'ss area. The 1st is 30.
131-132	Last used variable name		
216	ONERR (0 clears)		CLRERR
218-219	ONERR line number	16126/16127	
APPLE		ADAM	
222	ONERR error code		x= ERRNUM(1)
225	x of last HPLOT	16763	
226	y of last HPLOT	16764	
228	HCOLOR code	16777	
231	SCALE	16765	
232-233	Start address of shape table.	16766/16767	
234	HIRES collision check.		
241	SPEED	16129(255)	
243	FLASH speed	159(12)	
249	ROT		
	Poke limit	16149/16150	Poke each with 255 for unlimited pokes.

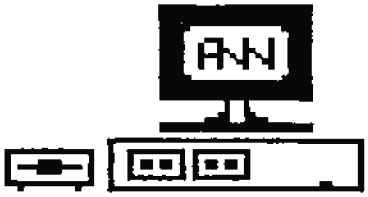
CALLS

-16384	Read keyboard	Peek(64885)	
-16368	Clear keyboard	Poke 64885,0	
-16336	Speaker click	print chr$(7)	
-16302	Full graphics	HGR2	
-16301	Split screen		
-16298	Lo-res	GR	
-16297	Hi-res	HGR	
-16297/285	PDL	use PDL commands	
-3288	Resume		
-3086	Clear Hires to black	HGR or HGR2	
-3082	Clear Hires to last HPLOT colour.		
-1036	Move cursor right.		

-1008	Move cursor left.	
-998	Move cursor up.	VTAB and VPOS(0) -1 commands range 0 - 23
-958	Clear text cursor down	Print chr$(24)
-922	Move cursor down	VTAB and VPOS(0) -1 commands range 0 - 23
-868	clear text cursor right	
-756	wait for keypress	POKE 16136,0: This can be done only inside a program.
-678	Wait for return	
-676	Bell, wait for return	
-198	Ring bell	PRINT CHR$(7)

Ron Mitchell

ADAM NEWS NETWORK™



HARDNOSE HARRY COMPARES HIS NEW CAR TO THE ADAM NEWS NETWORK

The New V600 GLS Super Car by Mur-Say-Dees	ADAM News Network
4.0 Liter, V600, Fuel-Injected Engine	250k of articles, ads, reviews
4 Speed, Automatic overdrive	Information received at 3 Speeds- 300, 1200, 2400 bps
A/C, Power brakes, steering, windows, and Power door locks	ANN unlocks the POWER of ADAM
50 watt, AM/FM, Stereo cassette w/ 6 Speakers + Powre antenna	More than 6 Speakers, with more power. Ron Collins, Tom Keene, Tony Morhen, Ron Mitchell, Rich Clee, Pat Herrington, Jim Notini Dave Sands, B.David Cobley. If you want stereo - Jim and Bruce Walters.
Michelin All Season, Steel Belted Radial Tires	MEI/Micro All Season, Reinforced Rim, Disks
4 Tires + a Spare	2 - 3 Disks + a Mailer
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COMPUTER PROGRAMMING IDEAS

A PHILOSOPHY OF PROGRAMMING With Strategic Asides

by Peter Hartzler

Writing computer programs is an art, like any other form of writing. In this article I shall explore some of the philosophies involved. I will also attempt to discuss some programming strategies. This last item can prove elusive because people approach programming as a matter of individual taste.

What I won't be doing in this article is that I won't be supplying code fragments as in a "how to" sort of article. There is no shortage of material on that subject, and it is a very good idea to review all that you can find. But I want to cover a much less often discussed area of programming; not how, but style.

Computer programming is unique among the arts. This is because it is a particularly demanding interface between the flexible and adaptable human experience and the rigid, precise and logical structure of a most exact machine. Both humans and computers are capable of amazing feats. People can do spectacular things involving intuition, insight and pattern recognition. The computer's strength lies in its brute strength ability to operate quickly with numbers.

This difference immediately presents the programmer with some problems. To look at the difference between people and computers another way, people are incredibly sloppy, and computers are incredibly stupid. People have trouble doing the same thing twice the same way while computers can happily do a job repeatedly in one unchanging way.

To make matters worse, computers will do exactly what you tell them to do. If you are imprecise in your instructions, or leave out a bit of punctuation, your results will be undefined at best. To ease the differences between people and computers, machine programmers are often called upon to develop methods which help other people and themselves communicate with the machines. Any one of these methods developed for assisting people to communicate with the machine is called a "computer language".

Computer languages help to bridge the gap between people and computers in several ways. They present the programmer with a more "natural" interface to the machine. Though in truth the computer can only execute instructions encoded as binary numbers (machine code), a language allows the machine to interpret a set of more basic commands. The computer then translates those commands into it's own binary language.

Computer languages come in many flavors. One good way to divide them into groups is by "level". The level of a computer language describes how automatic its functions are. For instance, BASIC is a high level language. Assembler is a very low level language.

It is important to choose the appropriate language for the job at hand. Many programmers start out with the BASIC language. BASIC is a language designed for beginners; that's what the B stands for (Beginners All-purpose Symbolic Instruction Code). It is flexible and forgiving, automatically handling many of the more advanced details, and often helping the user by reporting the actual error he has made, whenever he has done so.

BASIC does have some significant failings as a language. Perhaps the most important one is the lack of its abiity to use "labels".

A label is a name for a section of code. For instance, instead of saying "GOSUB 123", a label capability would allow you to say "GOSUB InputUserName". Most other languages support labels.

Still, BASIC is a good language with which to begin programming because the advantages outweigh the disadvantages for the beginner. (BASIC is an especially good language with which to begin, since it came "free" with your ADAM).

As I mentioned above, the most important quality of a computer language is that it makes our computer instructions readable to humans. As a programmer, an important part of programming is to ensure that the code written is as readable, (as understandable to others, or to ouselves later when familiarity has worn away), as possible. Not only is it easier to create programs this way, but it is easier to modify them when necessary. The ability to go back later and modify your programs is very important, but Ill say more on that later.

Another less obvious advantage of "high level" languages, like BASIC, is that they do much of the work for us. Not only in terms of translating our commands into machine code, but also in terms of "housekeeping chores". This includes

keeping track of variables, initializing file control blocks, memory management and other obscure but very involved tasks.

It seems that as programmers learn, they go through definable stages, and while they are within any particular stage, they make certain common mistakes. I'm not talking about bugs, like trying to read a file before opening it, or forgetting to close it. I'm talking about mistakes that might not even cause your program to fail. These stylistic mistakes will make your program harder to maintain and modify, and make it harder to locate and fix any bugs you must contend with.

Some common programming errors, or mistakes; not in any particular order are:

1. Failure to design before coding
2. Failure to document your program
3. Cryptic variable names
4. Overly ambitious project stages
5. Duplicate code
6. Uncentralized code
7. Lack of modularization

THE IMPORTANCE OF DESIGN

Planning what you want your program to do is extremely important. Obviously, if all you want to do is to write a routine to print "Hello world" on the screen, then the planning can be minimal. But on more ambitious projects you will save yourself much trouble by deciding ahead of time what you are trying to do.

You should write out the steps involved, and make sure the logical flow of the idea is sound. Some people like to draw boxes with the names of processes in them, and use lines to describe the flow of the program. If there are inconsistencies, this may be the best way, (and is undoubtedly the best time), to find them.

Suppose you decide later to go in to the program and add another feature, or change the program in some way. Having an outline of the program will be a big help in figuring out where the change should be made. A well planned program simplifies the task of locating other areas that might be affected by a particular change.

THE IMPORTANCE OF DOCUMENTATION

There are two types of documentation that should accompany **ALL** programs: **User Documentation**, and **System Documentation**. Depending on the complexity of a system, the documentation may be very simple, or it may be very detailed; but there is a big difference between "simple documentation" and "no documentation".

SYSTEM DOCUMENTATION

System documentation is a record of what the program does, and how it does it. The most simple form of system documentation is that of embedding comments in the code. By inserting REMarks in your program, you will make it much easier to tinker with your program after it's been on the shelf for a time. In-line comments are essential where the program does something unusual or difficult to understand.

Remember, if seemed involved to you as you figured out how to do the routine the first time, after time passes and the familiarity you gained in the "doing" of it wears off, it will be difficult again when you try to figure out what you did, and why.

USER DOCUMENTATION

The importance of user documentation becomes obvious if you have ever received a program from an outside source, and had to spend hours trying to figure out how to do something that turned out to be simple once you knew how. Again, for smaller programs, the user documentation can be included right in the program. One good way to do this is to offer a <H>elp option on the selection menu. This could bring up a screen full of hints to get the user on his way.

For larger programs, it is worth while to create external documentation. A user manual can make a program seem much more real, and much more worthwhile. There are many excellent programs available in public domain and for sale, that will never become popular because only a hacker with time to kill could figure out how to use one of the things.

CHOOSING THE VARIABLE NAMES

One of the best tricks around for making your code easier to understand, is to use meaningful variable names. There is a world of difference between calling some value 'X' and calling it 'HEIGHT'. Wherever possible, your variable names should describe the item they represent.

But some languages such as SmartBASIC present a pitfall where variable names are concerned. SmartBASIC only recognizes the first two characters of a variable name. So, in our example above, HEIGHT is one variable, and HELP might be another. Basic recognizes only the first two characters and would consider both to be the same variable "HE". This is the source of many bugs.

All languages place a limit on the number of characters that they process to identify the variable. Many modern languages allow 32 or more characters to be significant. This allows variable names like "Number_of_empl_recs_2_be_printed".

When limited in your variable names, it becomes **ESSENTIAL** to make comments in your code that describe what the variables are, that is to say, what the letters of each variable represent.

One excellent trick is to include a "Header block" at the top of your program. This is a section of nothing but comments, or possibly variable initializations. The idea is to place this kind of information in the "Header Block" in order to make it very easy to see what variables are floating around out there.

OVERLY AMBITIOUS PROJECTS-----START SMALL!-----

Writing a program can be like starting a garden: One piece of good advice common to both is to "start small!" By limiting what you include in your first versions of a program, you allow yourself the chance to get a solid start, and evaluate your basic design. Wait until after the core works before you start adding bells and whistles to the thing.

One common and reccommended approach is to create the main menu of the program, and then "add in" the options one at a time. This sort of "breaking the problem down into smaller pieces", is very useful as a way to keep control of the beast. I can tell you that it is a bad feeling when you decide that you have so lost sight of what you were trying to do that your best choice is to abandon the attempt and start over.

DUPLICATE CODE

One important benefit of a careful design is that this will help you to spot "action" situations that happen repeatedly. For example, suppose your program prints a "form" that has several places where a solid line prints across the page. You could hard code the lines wherever they are needed, (duplicating the previous code each time), or you could write a subroutine that prints a solid line, and call it when you need to have one printed.

Eliminating duplicate code has some important advantages. The main one is that if you decide to change the way lines print, you can change the program in one place and be done with it. Another advantage is that this approach often makes your program smaller.

CENTRALIZED CODE

Similar to the idea of eliminating duplicate code, centralizing code can be very helpful to the general useability of a program. Centralizing code involves bringing operations together so that a certain function is only done from one place. If you centralize the location in your program that sends data to the printer, then you suddenly get much more control over how the program talks to the world.

To continue with our "form" printing example above, suppose you get tired of running your printer to test the program. You could easily modify the "output code" in that one place to send printout to a file, the screen only, or wherever. You could even add a feature that would allow the user to determine where he wanted the report to go by the press of a key. If your "output code", (or whatever code you're dealing with), is spread out all over the place, then such options become much more difficult to add.

MODULARIZATION:

One way to make your code "impossible to debug" is to put all of the operations one after the other, from start to finish, with no subroutine calls of any kind. If you need to do several things in a program, then it is a good idea to make calls to subroutines that do the desired tasks. Each subroutine is a "module".

One common approach is to have an area that you define as the "main" or "central" part of the program. This section has a series of subroutine calls. By doing this, you gain a large amount of control over the flow of the process.

Modularizing can make your code positively simple to understand. You start at the top.

1. Call the initialization functions.
2. Call the routine that paints the welcome screen.
3. Call the section that paints the main menu.
4. Decode the user choice, and call the wanted routine.

Ding! you have an "Instant Road Map"!

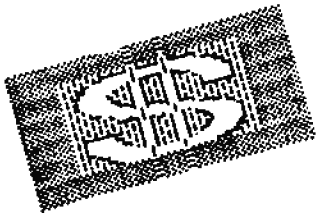
Similarly, any time your routines start to get large, breaking them into subroutines that contain the logical components can make life much easier. This frees you to think about only that which is at hand, (one subroutine at a time), and leave the rest alone until you get around to it.

PERSONAL LIBRARIES

One added bonus to breaking your code up into functional blocks or modules, is that you can go back and reuse these blocks. If you have a useful routine, (like one that writes to the printer, or one that adds two numbers for examples), you can use it in more than one program!

CONCLUSION:

The purpose of this article is to get you to look at program writing in a different way, other than the ways in which you may have previously looked at it.



It is very easy to get caught up in the micro-details of how a program does it's work. In getting caught up in this way, you may miss the general organization of a program.

Complete organization is very important to developing useful code. So, the next time you are reading your own or someone else's work, think about the flow, design, ease of reading, modularity and organization of the program. You will find that this greatly increases your understanding, and also greatly increases your power to create stable and useful applications.

If you find a program that is well organized, but has no documentation, write in your own labels to the "GOTO"s and "GOSUB"s, and see how much more clearly the program is then understood. This is a good way to convince yourself or others that good program organization and good program documentation are vital to program creation.

PERSONAL NOTE FROM THE AUTHOR

When asked to write this article, I almost declined. You see, I no longer use an ADAM. Then I decided that I might shed some light on this business of programming. When I got my ADAM, in 1985, I knew almost nothing about computers. I am now a professional programmer, self taught. This transition was largely possible because the ADAM is an excellent machine for learning. And the users are a friendly and close-knit group, and they are all happy to help.

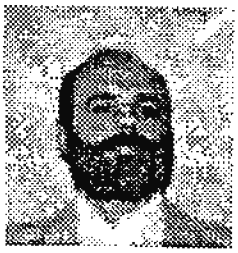
If you don't presently belong to a user group, find one and join it. Then give whatever help and service you can to the group. And likewise take from it that which will help you grow. If your group doesn't address your concerns, change that if you can. If you can't, then look around, and find one that has similar interests to those you have, and join that one.

Peter Hartzler

Z80 MACHINE LANGUAGE PROGRAMMING

by Guy Cousineau

In SMARTBASIC, any PROTECTED RAM area may be used to write machine language routines.



But why machine language? Because there are some operations which simply cannot be performed by standard BASIC commands or functions. Additionally, some microprocessor intensive tasks will execute very slowly in BASIC; machine language is one way to speed them up.

In this chapter, we will look at 3 ways of accessing machine language routines from SMARTBASIC. Although source code examples will be supplied, the purpose of this article is NOT to explain Z-80 operation codes and their use, it is intended for those who know something about ML and want to incorporate it into BASIC programs.

CALL

CALL is the most simple function of the three. It takes care of housekeeping operations such as saving program pointers prior to executing your machine language routine. It is the programmer's responsibility, however to preserve the stack or to set up a local stack. In most cases, BASIC's enormous stack should be sufficient.

You may have seen CALL instructions used in sound generation, disk copy programs, and sprite animation. These are three examples of functions which cannot be performed in any other way. Here is a listing of a sound generation routine:

(The listing is in assembler format and includes comments after the ";". Assemblers ignore statements which follow ";" on the same line, like BASIC ignores REM, except that the comments follwing REM in BASIC are ignored until a Carriage Return is encountered, regardless of the number of lines used).

The listing:

```
LD      A,0     ;put value in A
OUT     (255),A ;send it
RET             ;return to BASIC
```

If the above instructions were assembled into machine language and stored in a RAM location, a PEEK of the addresses in that location would show, (from lower address to upper, (the way in which the Z80 microprocessor reads instructions!):

62 0 211 255 201.

That seems simple enough, but I have obviously left out something. After running the above mnemonics through an assembler, (or after having assembled them ourselves by looking up the codes in a conversion table), how do we POKE it in memory? In basic, the process may be as follows:

```
10 LOMEM: 27417: REM make room for it
20 for x=0 to 4:REM read 5 values
30 READ y
40 POKE 27407+x,y: REM put in memory
50 NEXT x
60 DATA 62,0,211,255,201
```

Now if I run the above Basic program; and then, (either in the immediate mode, or in a subsequent Basic instruction in my program), I make a

CALL 27407",

a 0 will be sent to the sound port. If I want to send any other value, I can POKE it into memory at 27408 (where the 0 is) and CALL 27407 again. (Refer to other material on sound generation for the specific information required to create notes or sound effects).

READ/WRITE block routines have been around for some time but all those that I have seen lack one essential element: they neglect to check for read/write errors. When the BOS performs a read/write operation, the error code is returned in register A. Since we have no direct access to registers when using Basic, we must devise another approach; here's my routine which I install at 27420:

```
XOR     A       ;clear accumulator
LD      (27419),A ;reset error
LD      A,0     ;device
LD      BC,0    ;high block number
LD      DE,0    ;low block number
LD      HL,0    ;RAM address
CALL    64755   ;read block
RET     Z       ;no error
LD      (27419),A ;get error
RET             ;exit
```

When a CALL is made to 27420:

```
CALL   27420,
```

this routine starts by clearing the error. It then loads A with the device number, BC and DE with the block number, (no device presently available for the ADAM has enough storage to require that BC be set to anything but 0, so BC must always be 0), and HL with the address where the information will be "read from" or "written to". 64755 is the address of the READ_BLOCK routine, 64750 is the address of the WRITE_BLOCK routine.

The program returns the error code in 27419. If there is no error, the PEEK of 27419 is zero. When there is an error, the error code will appear in 27419 as something other than zero. (See the list of error codes in the table further below.

Following are the addresses for the parameters of the above program:

27425	device number 4,5,8,24
27430-31	block number lo byte, hi byte
27433-34	RAM address to "read to" or "write from"
27436	Make 243 for read, 246 for write

A SHORT DIVERSION TO MAKE AN EXPLANATION

In the "CALL" example above, and in several places later in this article, I make reference to storing memory addresses as lo-hi, or lo byte, hi byte. This means that you must POKE 2 values into adjacent addresses. This is because one byte of eight bits can only represent numbers from 0 to 255.

Using two bytes, we can store any value from 0-65535, the full size of the ADAM memory. To store the address in two bytes, a calculation must be made, and the value which represents the lower part of the original number, goes into the lower of the two adjacent bytes. The value which represents the higher part of the original number goes into the higher of the two adjacent bytes.

Following is the easiest method to make this calculation:

```
100 x=28817: REM POKE it here
110 y=20256: REM POKE this value
120 GOSUB 900
...
899 REM  routine to POKE the value y into addresses x
    and x+1
900 POKE  x+1,y/256:  REM high byte is  whole  number
    part of the division
910 POKE x,y-256*PEEK(x+1): REM low byte is remainder
920 RETURN
```

Note that in line 900, y/256 does not necessarily result in an integer value; the POKE command, however, converts all values to integers by dropping the decimal part of the number, prior to placing them in memory. Thus extracting the POKEd value by using PEEK in line 910 correctly calculates the integer value of the high byte.

AND NOW BACK TO THE "CALL" COMMAND

Following is the entire data stream of the above machine language routine to POKE into RAM starting at 27420:

```
175 58 27 107 62 0 1 0 0 17 0 0 33 0 0 205 243 252
200 58 27 107 201
```

The last byte (201) should be at 27442.

To use this routine, have the Basic program request or determine the block number, memory address, and device number, select read/write, and CALL 27420.

Following is part of a Basic subroutine to do that:

```
99      REM R/W error check subroutine
100     ...poke block, memory, device, etc
        ...
150     CALL 27420
160     e=PEEK(27419)
170     IF e=0 then return: REM all ok
180     PRINT "Error ";e
190     STOP
```

When using this routine, the program will abort when the BOS reports an error. If you want to get more sophisticated, following are some of the error codes which could be inspected after command line 160, and appropriate action taken or error messages given:

1,2,3	device unavailable
5	no file
6	file exists
11	file too big
12	directory full
13	tape/disk full
15	rename error
16	delete error
17	range error
21	bad device status
24	bad directory on medium

Now let's do something more complex: SPRITE animation! Sprites are managed in 2 tables which the programmer must maintain in RAM: the SPRITE SHAPE table, and the SPRITE ATTRIBUTE table.

The SPRITE SHAPE table has 32 segments of 8 bytes each, (256 total), each segment representing one 8X8 sprite shape.

The 8 bytes represent a horizontal bitmap (on off) of each of the 8 lines of a sprite shape. Thus if sprite number 0 is a circle, you could have the following definition. Note that this is one segment of 8 bytes, defining the shape of one SPRITE:

Binary1 or Bits Set	Dec.Val.
00011000	24
00111100	60
01100110	102
11000011	195
11000011	195
01100110	102
00111100	60
00011000	24

The SPRITE ATTRIBUTE table has 32 segments of 4 bytes, (a total of 128 bytes), each segment of which represents the attributes of one sprite.

The first byte of each set of 4 bytes is the Y coordinate, (0 to 191); the second byte is the X coordinate, (0 to 255); the third byte is the sprite number, (0 to 31); and the fourth is the sprite colour. The first sprite does not need to be number 0.

You can use the same sprite definition to place the same shape in different colours on different parts of the screen. You are limited, however to 32 sprite definitions (shapes) with their respective 32 sprite attributes (location, number, and colour).

Sprites can be displayed in 4 fashions:

SIZE	VALUE
8x8	R0 (224)
8x8 double	R1
16x16	R2
16x16 double	R3

Following is a machine language routine which updates all 32 sprite positions at once:

```
LD      B,1     ;register
LD      C,0E0H  ;use 8x8 sprites
CALL    64360   ;update vdp
LD      A,1     ;shape definitions
LD      IY,32   ;do all sprites
LD      DE,0    ;offset in table
LD      HL,28256 ;my def's are here
CALL    64812   ;update vram
LD      A,0     ;position table
LD      IY,32   ;do all sprites
LD      DE,0    ;offset in table
LD      HL,28512 ;my table is here
CALL    64812   ;update vram
RET
```

This routine can be POKED anywhere in memory; I use 28000 with the following data:

```
6 1 14 224 205 32 253 62 1 253 33 32 0 17 0 0
33  96 110 205 44 253 62 1 253 33 32 0 17 0 0
33  96 111 205 44 253 201
```

The last byte should be at 28037.

Three user parameters must be supplied; the size and the location of the 2 user tables:

```
28003       sprite size    R0 R1 R2 R3
28017       shape definition (lo-hi)
28032       position table (lo-hi)
```

The VRAM write routine can be indexed in order to update only one sprite at a time but this would require several modifications to the routine on every CALL. Once you get this installed, you will find that it is fast enough that you don't need to bother for most applications; you would probably spend more time calculating offsets.

USR

So far, we have only discussed the CALL command. USR is similar to CALL except that you address routines via a function number rather than remembering the exact memory address. You might easily get confused between your 3 routines at 27407, 27420, and 28000, (as shown in the above examples). Furthermore, you might accidentally issue a CALL to 24787, which would surely be disastrous.

USR has the following syntax:

```
a=USR(n)
```

where 'a' is any legal numerical variable, (that is, not a string like "a$" for example), and 'n' is the function number, from 0 to 127. (Note that no particular value is returned in "a" by the implementation of the USR function. It is merely a part of the syntax).

The USR machine language routine can extract the function number "n" from the address within the Basic RAM pointed to by the ISR DE double register, and via a preamble routine that you write, whose address you previously loaded to the USR address at 16130, 16131, (lo-hi), can direct the ISR to

jump to your "n"th subroutine, and begin to operate on it).

The following is a sample preamble code to a series of user functions, (for a case where there are a maximum of 3 different routines, (0 to 2), to be specified by the function number 'n'):

```
        LD      A,(DE)  ;get function, (the 'n' from the
                        ;Basic command above)
        AND     7FH     ;strip high bit
        CP      3       ;max number of functions, (0 to 2)
        RET     NC      ;illegal function, so back to Basic
        LD      HL,FTABLE ;jump table for routines
        LD      B,0
        LD      C,A     ;function in BC
        ADD     HL,BC
        ADD     HL,BC   ;2 bytes for each function
        LD      A,(HL)  ;get low byte
        INC     HL
        LD      B,(HL)  ;high byte
        LD      L,A     ;low byte to L
        JP      (HL)
FTABLE:
        DW      FN_0    ;for n=0
        DW      FN_1    ;for n=1
        DW      FN_2    ;for n=2
```

The routine starts by extracting the function number "n" which Basic stored in the address in DE, and comparing it to the maximum function number; in this case we only have functions 0,1,2. Then the pointer to the execution routine is calculated and the execution address extracted. The DW labels after "FTABLE" are pointers to the start of each of the subroutines.

Before using a USR function, you must tell SMARTBASIC where to find the preamble routine. this is done by POKEing the address of your preamble routine into the Basic USR address 16130, 16131 (lo-hi).

Thus you can access any one of several pre-stored ML routines via one USR command and the parameter (n). This certainly is an improvement over the CALL routine. The disadvantage of the USR function is apparent when it is compared to the & routine. The USR function does not allow other parameters to be passed directly from the Basic program to the ML routine. In the case of the sound routine, you still need to POKE the sound value into the routine at the proper address prior to using USR(n).

Following is a simple USR routine with 2 functions. USR(0) performs a TEXT command and prints a message. USR(1) makes a binary dump. Both routines use some of SMARTBASIC's printing utilities which are described at the end of this chapter. (Remember that comments following ";" on the same line, are ignored by the assembler).

```
;USR DEMO
;POKE 16130,72 and 16131,133 prior to using
;Reset LOMEM to 30000
;and POKE routine in starting at 29000
;
PRINTA  EQU   2EDAH     ;print character in A
PRINTS  EQU   12110     ;length encoded message IN HL
TEXT    EQU   11065     ;text mode routine
;(just a blank line to make reading easier)
        ORG   29000     ;start assembly here
        LD    A,(DE)    ;get function number
        AND   7FH       ;strip high bit
        JR    Z,FN_0    ;was function 0
        DEC   A         ;check if function 1
        JR    Z,FN_1    ;do it
        ADD   '0'+1     ;make function number ASCII
        LD    (FNNUM),A ;add it to error message
        LD    HL,FNMSG  ;point to error message
        CALL  PRINTS    ;print error
        RET             ;exit
;
;function 0
;
FN_0:   CALL  TEXT      ;restore screen
        LD    HL,THEEND ;bye message
        CALL  PRINTS    ;print it
        RET             ;exit
;
;function 1
;
FN_1:
        PUSH  DE        ;save value in DE
        LD    HL,DEMSG
        CALL  PRINTS
        POP   AF        ;get D into A (trick)
        PUSH  AF        ;save it again
        CALL  SBOHA     ;dump D
        POP   DE        ;get DE back
        LD    A,E
        CALL  SBOHA     ;dump E
        LD    A,13      ;a carriage return
        CALL  PRINTA    ;print it
        RET             ;get out
SBOHA:
        LD    B,8       ;must do 8 bits
SBOHA1:
        RLCA            ;get top bit in carry
        PUSH  AF        ;save A
        LD    A,'0'     ;start with a zero
        ADC   A,0       ;make 0 or 1 based on carry
        PUSH  BC        ;save counter
        CALL  PRINTA    ;print one bit
```

```
        POP   BC
        POP   AF
        DJNZ  SHOWAI    ;continue for 8 loops
        RET             ;done 8-dump
;
;messages
;
FMSG:   DB    23,'function #' ;first byte is length
FNUM:   DB    '0'       ;filled in by error handler
        DB    ' undefined',13    ;end of message
FRERR:  DB    30,'Function 0 restores text mode',13
DMSG:   DB    29,'The DE register in binary is',13
;
        END
```

If you want to POKE this program in via Basic, following are the HEX values. You'll have to convert them to decimal yourself, but here they are! (Does it become apparent at this point why assemblers and loader programs are so handy?)

```
1A R6 7F 28 0F 3D 28 16 C6 31 32 99 71 21 0E 71 CD 4E 2F
C9 CB 39 28 21 A5 71 CD 4E 2F C9 D5 21 C4 71 CD 4E 2F F1
F5 CD 7D 71 B1 7A CB 7D 71 3E 0D CD DA 2E C9 06 08 07 F5
3E 30 CE 00 C5 CD DA 2E C1 F1 10 F2 C9 17 66 75 6E 63 74
69 6F 6E 20 23 30 20 75 6E 64 65 66 69 6E 65 64 0D 1E 46
75 6E 63 74 69 6F 6E 20 30 20 72 65 73 74 6F 72 65 73 20
74 65 78 74 20 6D 6F 64 65 0D 1D 54 68 65 20 44 45 20 72
65 67 69 73 74 65 72 20 69 6E 20 62 69 6E 61 72 79 20 69
73 0D
```

&

AND NOW, ENTER the more powerful & routine which can parse a series of commands since it begins operation with a pointer to the current BASIC command line as stored in Basic RAM. At BOOT, SMARTBASIC directs the & routine to "REM", which effectively ignores the command.

(You may have seen programmers on occasion use the "&" as a REM statement. This practice is NOT recommended since you may pass your program to someone who has installed an & routine, and cause several ill effects).

In order to use the & routine, it is necessary to know something about the use of the Z80 registers in SMARTBASIC:

DE=pointer to current command line, that is, it points to the current command line of the basic program being run, and particularly it points to the symbol "&", of that line.

C'=number of characters remaining in the command line, that is, the number of characters preceding the carriage return which marks the end of the present Basic command line.

The & routine gets its pointer from memory address 16132, 16133; thus you must POKE the address of your & preamble routine in this location. Following is a preamble and exit routine for an & function:

```
        EXX             ;use alternate set
        LD      A,C     ;get the length
        LD      C,0     ;set line to empty
        EXX             ;back to regular set
        LD      H,0
        LD      L,A     ;length to HL
        ADD     HL,DE   ;point to end of line
        LD      (SAVEDE),HL ;save exit value for DE
        INC     DE      ;skip header
        INC     DE
        LD      A,(DE)  ;get length byte
        INC     DE      ;skip to first character
        LD      B,A     ;save character count
;
;go on from here to decode the meaning of each character in
the Basic command line, the line in which this & was
encountered, and which is pointed to by DE. The meanings are
those which you planned for the program. For example, if DE
points to the ASCII of a "G", it might mean to jump to a
routine to read a file into RAM, (maybe the filename would be
allof the characters following the "G", until a number "3"
was encountered). Or the G could mean for the routine to
change the next three numbers in the Basic command line from
decimal to HEX, and store them at some location in RAM.

What each symbol in the command line means, (after the &
character), is whatever the programmer may design them to
mean as he writes his HL program.

;INCREMENT DE and DECREMENT B after each character is used.
;if B=0 then end of command is reached, that is, the DE now
;points to the next Basic command line.
;
;all routines must exit via the folowing "restore routine":
;
EXIT:   LD      DE,(SAVEDE) ;restore register value
        XOR     A       ;clear error flag
        SCF             ;set completion ok
        RET
```

Although a lot of work may be imposed initially upon the programmer, the & routine can interpret, (if so programmed), complex commands like:

```
10 & Normal Colour=10
20 & Border Colour=4
30 & Voice=1
40 & Volume=9
50 & Frequency=823.12
60 & Read block 12 from disk 1 at 30000
```

& can in this manner, be used to create your own set of commands to complement those already existing in SMARTBASIC.

Following is an extract from an & routine I have written as a demo. It it part of a bigger routine which does HEX/DEC/HEX conversions. The listing below only converts HEX to DECIMAL but still requires an H prior to the number to be decoded. After installing this routine you could type:

```
        & hFC2D
```

and get

```
        64557
```

The listing:

```
;
;& routine demo
;must POKE 16132,72 and 16133,113
;set LOMEM to 30000
;and POKE data in
;
PRINTA  EQU   2B0AH     ;print character in A
PRINTS  EQU   12110     ;print length encoded message
;
        ORG   29000
        EXX             ;alternate set
        LD    A,C
        LD    C,0       ;clear line
        EXX
        LD    B,0
        LD    L,A       ;length of line to HL
        ADD   HL,DE     ;point to end of line
        LD    (SAVEDE),HL ;save DE exit value
        INC   DE        ;skip header
        INC   DE
        LD    A,(DE)    ;get length byte
        INC   DE        ;point to first character
        LD    B,A       ;copy length of line to B
;
SKIPSP:
        LD    A,(DE)    ;get a character
        CP    ' '       ; is it space
        JR    NZ,DONESKP ;ready to proceed if not
        INC   DE        ;skip the space
        DJNZ  SKIPSP    ;skip more spaces
        JP    EXIT      ;abort if all spaces
;
DONESKP:
        AND   5FH       ;make upper case
        CP    'H'
        JP    NZ,EXIT   ;used to be  jump to decimal
;
;HEX input routine
;aborts if non-number input
;but never reads more than 4 bytes
;
HEXIN:
        INC   DE        ;skip the H prefix
        DEC   B
        JP    Z,EXIT    ;no characters left
        LD    HL,0      ;set default output value
        LD    A,5
        CP    B
        JR    C,HEXIN1  ;we have less than 4 characters
        LD    B,4       ;reset to max
HEXIN1:
;       LD    A,(DE)
        OR    A
        JR    Z,HEXDONE ;end if null
        CP    ' '
        JR    Z,HEXDONE ; or space
        SUB   '0'
        JP    C,ERROR
        CP    10
        JR    C,NUMOK   ;we have a 0-9 digit
        AND   5FH       ;make uppercase
        SUB   7         ;make A-F if 10-15
        JP    C,ERROR   ;oops
        CP    16
        JP    NC,ERROR  ;oops again
;slide bits left 4 times in HL
NUMOK:
        SLA   L
        RL    H
        SLA   L
        RL    H
        SLA   L
        RL    H
        SLA   L
        RL    H
        OR    L         ;add incoming digit
        LD    L,a       ;put back in L
        INC   DE        ;move buffer up one
        DJNZ  HEXIN1    ;read another digit
;
HEXDONE:
        CALL  DECIMAL   ;PRINT HL in decimal
        JR    EXIT
ERROR:
        LD    HL,SINTAX ;error message
        CALL  PRINTS    ;
EXIT:
        LD    A,13
        CALL  PRINTA    ;add a new line
        LD    DE,(SAVEDE) ;restore BASIC's pointer
        XOR   A         ;clear error flags
        SCF             ;we're done
        RET
```

```
DECIMAL:
        PUSH  HL
        PUSH  DE
        PUSH  BC
        LD    B,0       ;leading zeros flag
        LD    DE,10000
        CALL  SUBDIV
        LD    DE,1000
        CALL  SUBDIV
        LD    DE,100
        CALL  SUBDIV
        LD    A,L
        JR    SUBDV4
SUBDIV:
        XOR   A         ;set out digit to zero
SUBDV1:
        SBC   HL,DE
        INC   A         ;add 1 to digit
        JR    NC,SUBDV1
        ADD   HL,DE     ;undo subtraction
        DEC   A         ;adjust count
        JR    Z,SUBDV2  ;digit is 0
        LD    B,A       ;clear zeroes flag
        JR    SUBDV3
SUBDV2:
        OR    B         ;is zero flag on?
        JR    NZ,SUBDV3
        LD    A,' '-'0' ;make A a space
SUBDV3:
        PUSH  HL
        PUSH  DE
        PUSH  BC
SUBDV4:
        ADD   A,'0'     ;make ASCII
        CALL  PRINTA
        POP   BC
        POP   DE
        POP   HL
        RET             ;done one digit
;
SAVEDE: DW    0         ;space to store DE
SYNTAX: DB    11,'Bad Syntax',13
;
        END
```

To POKE this routine in, following are the HEX values:

```
D9 79 0E 00 D5 26 00 6F 19 22 FA 71 13 13 1A 13 47 1A FE
20 20 06 13 10 F4 C3 B6 71 E6 5F FE 48 C2 B6 71 13 05 CA
B6 71 21 00 00 3E 05 D8 38 02 86 04 B7 20 2E FE 20 20 2A
D6 30 D2 B0 71 FE 0A 38 0C B6 5F D6 07 DA B0 71 FE 10 D2
B0 71 C8 25 C8 14 C8 25 C8 14 C8 25 C8 14 C8 25 C8 14 85
6F 13 10 CF CD C2 71 18 06 21 FC 71 C8 4E 2F 3E 0D C8 DA
2E B0 5B FA 71 AF 37 C9 E5 D5 C5 06 00 11 10 27 C9 0C 71
11 E8 03 C8 0C 71 11 64 00 C8 0C 71 7D 18 15 AF BD 52 3C
30 FB 19 38 20 03 47 18 05 B8 20 02 3E F0 B5 D5 C5 C6 30
C9 DA 2E C1 D1 E1 C9 00 00 0B 42 61 64 20 53 79 6E 74 61
78 00
```

(Do you want to do this by hand? It would be far easier to use a public domain assembler in CPM, and convert hex file to Basic with a utility program, all of which are available. There will be more about that below).

MACHINE LANGUAGE ROUTINES IN BASIC

If you intend to use complex machine language routines, you may occasionally want to print something to the screen. If so, you can make use of 2 routines which already exist in SMARTBASIC:

PRINT CHARACTER IN A resides at 11994. Thus if you want to print a question mark, you simply do:

```
        LD      A,'?'
        CALL    11994
```

The advantage of using the Basic print routine, is that it will perform word wraps and screen scrolls when required.

If you want to print a long message, you can use the Basic LENGTH_ENCODED routine at 12110:

```
        LD      HL,MESSAGE
        CALL    12110
MESSAGE:
        DB      14      ;length of message
        DB      13      ;a carriage return
        DB      'Guy Cousineau'
```

If you want to get USER input into your routines, you can use the BDS READ_KEYBOARD routine located at 64620; it returns a character in register A. Note that this routine waits until a character is pressed:

```
        CALL    64620   ;get character
        CP      3       ;is it ^C
        RET     Z       ;yes, abort
        CP      'y'     ; is it YES
        JP      Z,YES   ;process yes answer
        .....
```

Thus you could use a BDS function to get a routine started and it could prompt the programmer/player for the required parameters. See chapter 19 for more useful BDS routines.

If you plan on creating complex machine language routines, you may wonder how you will ever accurately determine the POKE values. If you have CP/M or TPDS, you can save a lot of

work by using a Z-80 assembler in CP/M. Then you can use the resulting PRN or HEX file to determine the POKE values and critical addresses in your routines.

****

EDITORS NOTE: TDOS is a great improvement over CPM, and makes it a lot more user friendly. TDOS replaces CPM and all CPM programs should run without problem on TDOS. Contact Guy Cousineau for more information.

****

The following program may be even more useful. Start by writing your routine in CP/M and assemble it to a HEX file.

Then use CPM.COM (CP/M) or PC.COM (TDOS) to convert the HEX file to BOS format. The next step is to run this program which will POKE your routine in memory for you:

```
100 INPUT "file to assemble "; f$
110 INPUT "drive number "; d
200 ONERR  GOTO 500
210 ? CHR$(4);"open "; f$; ",d"; d
220 ? CHR$(4);"read "; f$
229 REM extract the load address
230 INPUT w$: h$=MID$(w$, 4, 2):GOSUB 300
235 v=v*256: h$=MID$(w$, 6, 2):GOSUB 300: q=v+v
240 w$=" "+w$: p=q:? "first byte at", p
250 FOR x=11 TO LEN(w$)-3 STEP 2
260 h$=MID$(w$, x, 2):GOSUB 300: REM get a value
265 POKE p, v: p=p+1:NEXT
270 INPUT w$:IF MID$(w$, 3, 6)<>"000000" GOTO 250
280 GOTO 500 :REM end of file
300 a=ASC(LEFT$(h$, 1))-48: REM high nibble
305 b=ASC(RIGHT$(h$, 1))-48: REM low nibble
310 v=(a-7*(a>9))*16+b-7*(b>9):RETURN
500 CLREER:?:? CHR$(4);"close "; f$
510 p=p-1:? "last byte at ", p
540 ?:? " BSAVE           ,A"; q; ",L"; p-q+1
550 ? CHR$(160); :? CHR$(160);
```

The last thing the program does before exiting is to calculate the length of your routine and supply you with a BSAVE instruction line. Just scroll past BSAVE, enter a file name, scroll to the end of the line and press RETURN. Now your ML routine is saved as a file which can be quickly reloaded via a BLOAD command.

An alternate method is to create the listing and assemble it to a HEX file using TDOS or CPM as above, then load Basic, and use the "CPM2BAS" program to convert the HEX file to machine code.

This machine code may, (at user selection); be loaded directly to RAM, and be CALLed, (or BSAVEd as in the method explained above); or be entered to the screen as printed DATA statements. These data statements begin at 9000 and are then loaded directly to a program listing and saved to the media, by following the directions on the screen. For more details, contact Mel Ostler of Road Runner Publications, whose address and phone are listed in the name directory of this book.

When creating your routines to run with Basic, be sure to use the assembler's "ORG" to set the start address to not interfere with Basic routines. Basic routines end at 27407. Use the "LOMEM:" command to reserve the necessary room in RAM above Basic to store your program. There are other unused areas in RAM when Basic is running, but you must be familiar enough with its' use of RAM, that you don't use an area reserved for some other purpose.

Once you start experimenting with machine language routines, you may quickly discover the benefits. Sort routines, for example, will run up to 100 times faster in machine language than in Basic.

Should you have any questions about machine language programming, you may address them to me, Guy Cosineau. (See IMPORTANT NAMES AND ADDRESSES in the front section of this ASG).

Guy Cousineau of AJN Software

HARDWARE FOR THE ADAM

Original and Third Party Peripherals
By Ronald Collins

HARDWARE for the Coleco ADAM Family Computer System generally falls into one of three basic categories: the

"CONSOLE PLUG-IN's"

"SIDE-PORT PLUG-IN's"

"INTERNAL MODIFICATIONS"

The names of these three categories describe the way in which the hardware connects to the ADAM in each case. All three types can be used in conjunction with each other to further enhance the ADAM's native power.

To properly review all of the many peripherals could well require a book of hundreds of pages. As I don't have those 100's of pages to play with, I'll try to list as many of these products as I can and tell you a bit about their use.

I'll be covering an array of both original Coleco hardware and some very exceptional products by third party vendors; some old, and some new.

DISCUSSION OF AN INTERESTING "ASIDE"

Before getting into the different devices now available for ADAM, let me here answer publicly a question that I have been asked many times over the last few years:

"Why do you still hang onto your ADAM?"

This question is at least as popular as the old "why don't you buy a clone?...you could have bought one for what you paid, a little bit at a time, to build up your ADAM!"

Perhaps one of YOU has asked someone or even yourself one of these questions at some point! If you have asked, then maybe you came up with the same reasons and answers that I did.

In preparation of the answer to these perfectly valid questions, I must point out a few simple truths.

First of all, when Coleco began to market the ADAM, there were NO computers on the "for home use" market, that could touch the ADAM for included hardware and software support!

Only Coleco provided the buyer with a true letter quality daisy wheel printer.

Only Coleco provided a built-in, high speed mass storage system.

Only Coleco provided an electric typewriter that could convert to a dedicated word processor at the touch of a single button.

And, only Coleco provided all of this at a cost of hundreds of dollars under the thousand dollar mark!

My first stand-alone-ADAM was purchased at a close-out price of $299.95 at a local "Kaybee Toys" store. I bought it to replace my much in demand (by the kids) original $599.95 Expansion Module #3.

After 3 years of fighting with the kids for computer time, the second system at half the cost of the original seemed heaven sent!

For comparison of what other computers and peripheral equipment cost in those days, I recently started browsing through some of my old "QST" magazines of that time period, to see what the prices and features were prevalent, with respect to ADAM. I was astounded by what I found!

If you were "well to do" at that time, you could pick up a 48K TRS-80 Model III computer for $1039 or a 48K Apple II+ for $1199!

If you didn't like one of those two systems, you could pick up a 48K Atari 800 for $1049.

Disk drives for the Apple cost $439, for each one!

A CP/M card for the same unit came in at $279!

If you wanted a nice little daisy wheel printer to hook up to one of the new computers, you could purchase a VISTA for $1795.00, or even an NEC 5510 for $2595.00!

Dot matrix printers were much less costly, coming in between $449.00 for the Epson MX-70; and $999.00 for the Okidata SL-300.

And don't even ask about the price of software in those days!

When Coleco came out with so much computer for a cost of $699.95 a little over a year later, it was no wonder the competition went out of it's way to pour out the bad publicity with which we would have to live for the next few years!

Then, along came a multitude of IBM "clone" marketers with an all too similar penchant for high prices on hardware and software!

It would seem that by marketing the ADAM as a toy, at a toy's price, and going "belly up" business wise; Coleco demonstrated to the computer manufacturers a solid fact. That is, that a toy's popularity, (or that of any item marketed as a "toy"), tends to fade away as quickly as any other fad. As soon as the next level of "toy" hits the market, the old one is put into the closet, and forgotten.

But if you market a COMPUTER as a computer, even one with no more capability than the one sold as a toy, and at an over-board price; you can make a lot of money. (You also have a better chance of not ever having your system referred to as a "toy").

The market for the MS-DOS/IBM compatible system has become an ever more expensive and cut-throat business as more and more vendors learn this fact. In the mean-time, we must all remember that there is really very little these expensive computers can do for us, that an ADAM with the proper hardware and software can't do just as well.

To me, it all comes down to dollars and "sense", (not just cents, but that too!).

Almost any hardware you buy for your ADAM will be something that your current software will be able to use. (This is particularly true if the software is designed to run on the T-DOS, (or CP/M), operating system). And other more specialised software will now be available to you which supports the new forms of hardware.

All of the above being true, now you are allowed to do even more with the ADAM than you could ever have done before; and all of it with a relatively small investment that you might make for one or two choice hardware items.

This will always be less costly than the purchase of a brand new computer system at today's prices!

The price for much of the normal hardware will be priced at a "fits any computer" price, so you don't gain a thing by purchasing a DOS machine just to use the hardware.

The more "ADAM specific" hardware is usually priced at less than a third of the "big blue" price. Software to utilize new items on your ADAM will cost as much as 1/40th of the price of "more or less" similar software at the "IBM" price.

In addition to the very real money consideration, there is also much to be said for sticking to that with which you are already familiar. By the time you learn how to use a new computer and master the intricacies of the new hardware and software, you could have been finished with your task on even a BASE ADAM system.

END OF THE "ASIDE"

Okay, with all of that said, I'll climb down off my soap-box now, and get back to the main topic of this article: a review of the many new hardware products available for the Coleco ADAM Computer System.

1. THE CONSOLE BUS-ISE

Coleco was good at selecting developers for it's new computer. A look at some of the names involved certainly bears this out.

For the main system design, we have Hewlett-Packard to thank. I would venture to say that without their advanced design knowledge, our computer would never have held up so well for so many years, nor have been so advanced in design concept and multitasking capabilities.

The internal modem was developed by Anchor, a well respected name in the field of telecommunications.

These are just two examples used to point out the professional design of the ADAM.

As a result of its superior design, our computer has 6 different locations to which hardware accessories may be connected. Each location had an original purpose in mind, but most of the developers who came along after Coleco dropped our support, soon found OTHER uses for these access ports.

THE GAME PORT

Probably the most well known of the ports on an ADAM is seldom thought of as a place to connect new hardware. This is the game cartridge port on the right front corner of the top of the console. Besides the enjoyment derived from plugging in a great ColecoVision game and playing it, there are pieces of hardware that have been and are, being developed in the shape of a game cartridge to plug in at this point. A list of those currently available are:

"SUPER SKETCH", by Personal Peripherals. It is a graphics controller pad with built-in stylus connected to a game cartridge type interface. You can select various colors and fill patterns. Draw or trace a picture on the tablet and watch it reproduce on your TV monitor.

"DYNOMITE SOUND DIGITIZER", by Syd Carter. When plugged into the game port, an RCA type cable is connected between this unit and a low level audio source. Software is icon driven and easy to use once you get the hang of it. The package allows for the capture of sound which will be digitized and stored on disk, data pack or hard drive. Sounds, once processed, can be added to SmartBASIC programs and/or games.

"D.S.D. with SmartCLOCK CHIP", by Syd Carter. This version of the sound digitizer also contains a SmartCLOCK clock/calendar chip to allow date stamping of DOS files and constant access to the date and time of day. This is a very useful package.

"SMARTDISK CART", by Walter's Software. This, along with several other cartridge packages such as the SMARTMATE CART, the COLECO GRAPHICS PROCESSOR CART, the SmartBASIC CART and others; are such a good idea that I recommend them to everyone.

These cartridges provide instant access to existing and in-house developed program packages, thus saving wear on your disk drives and/or data-pack drives. Many of the features of some of these programs are only available with access via the game port.

I must add something else here as well. Walter's software has provided an excellent time saver by providing these cartridges.

The SmartBASIC version will save about 95% of the standard load time of SmartBASIC from a disk,, and that is a real savings.

All of the utility cartridges offer instant access to some really top-notch programs and features.

The Graphics Processor cartridge allows one to use an original Coleco package and capture its game screens.

The one that will be extremely useful to hard disk owners, is the SmartMATE and the DOS-BOOT cartridges; as these allow instant access to the hard disk system. Only the pulling of the GAME RESET switch is needed.

THE ADAMNET PORT

The ADAMNET port is located just below, and a little forward, of the ADAM printer power supply connector on the left-hand side of your ADAM console.

The port is shaped like a modular telephone jack, almost identical to that of the keyboard connector. This port was designed for the sole purpose of connecting disk drives to the ADAM, (although the keyboard and disk drive cables can use either of these ports, regardless of their order of connection).

"COLECO DISK DRIVE, by Colec. Coleco produced a single sided disk drive which allowed up to 160K of data storage. Some user's groups still carry a limited supply of these drives, and still others have upgraded the 160K drives to higher capacity formats. Added drives connect in turn to the first, and up to 7 drives have been successfully connected in series in this fashion.

Besides the original Coleco drive with the 5.25" single sided format, there are also a few versions of the 320K double sided 5.25" drives available.

"BVE ELECTRONICS". The first of these double sided 5.25" drives was a modified Coleco drive, developed by BVE Electronics, and these drives provided a 256K disk size.

In House Service Representatives, (ISR), then created a stand-alone version, (that is to say, it was not a modified Coleco drive), that provided 382K storage and connected through the printer power supply port.

"ORPHANWARE". Later, a company known as Orphanware, developed a more reliable version of the upgrade of a Coleco drive that allowed up to 320K of storage on an DOS media and later, and a 3.5" Coleco disk drive upgrade that provided 720K of data storage.

"K.& T." later came out with their own versions of these drive formats which were carried by many of the user's groups.

"MICRO INNOVATIONS DISK DRIVES" by Mark Gordon. Mark has created a great ADAM compatible disk drive that connects via this ADAMNET port. These drives are priced similar to the original Coleco one but provide much greater capacity. Currently, Micro Innovations has 320K and 720K drive formats.

"MICRO INNOVATIONS DISK DRIVES". A hard drive that connects

here is also being considered for future development by "MICRO INNOVATIONS DISK DRIVES".

THE INTERNAL EXPANSION SLOTS

Inside of the main console of the ADAM, just under the ventalation plate that can be popped off the top: there are located three expansion bus ports. Port ONE is on the left, Port TWO is in the center, and of course Port THREE is on the right, (logic is logic, that is all I can say!), closest to the connectors for the digital data drives.

EXPANSION SLOT ONE

Port ONE has been used for some rather useful hardware items. Coleco started the ball rolling when it produced the item for which this port was originally planned, and was soon joined by a couple of "third party" vendors who managed to find another use for it.

"ADAMLink 300 Baud Modem", by Coleco. This modem was designed and manufactured by a company called ANCHOR in the early days of the ADAM. Executives at Coleco adopted the 300 baud popular standard because they didn't feel the newer 1200 baud modems would ever be able to catch on. Today's 9600 baud modem users will tend to disagree with those executives.

The modem was simply plugged into Port ONE, and the console cover plate was snapped down in place over it. Two small plastic guides on the top of the modem slipped neatly into an air vent slot in the cover as the cover was snapped back into place. A two pin connector then slipped neatly through that particular air vent and plugged into the ADAMLink jack located between the two plastic guides. The other end of the cable then plugged into any modular telephone jack to complete the connection to an active telephone line.

"SYDModem 1200", by Syd Carter. This modem provided all that was originally predicted for the Coleco modem before a "Coleco executive action" killed their fledgling 1200 baud modem idea. Syd's modem plugs into Port 1 just as did the ADAMLink 300 baud modem.

This modem, however, is a true 1200 baud modem. A power plug/interface is also provided that plugs into the printer/power-supply port. A modular phone cable then connects between this interface and a standard modular phone jack.

The great advantage to the SYDModem is that it was designed around an industry standard Hayes modem. Using what is known as the "Hayes AT Command Set", the SYDModem is compatible with modem software utilizing the standard "Hayes" commands.

"OBS Clock/Calendar Card", by Orphanware. This card was designed by John Lingrel to provide ADAM owners with a low cost clock card for their computer. Current software provides date stamps and of course constant access to the time of day. T-DOS and CP/M access the clock as well as various BOS programs.

EXPANSION SLOT TWO

The center slot, Port TWO, was used by Coleco for a no-longer-seen "language card". I don't know much about the card other than from the stories that I have heard of it's ability to convert SmartWriter text into the language of the card (French, German, Spanish, etc.). I do know that a great deal has been done with the slot since then! (For a discussion on the "language Card", see chapter 3, "THE CREATION OF ADAM").

"PIA-2 Parallel Interface Card", by Orphanware. This card enabled an ADAM owner, (via provided software), to connect almost any of the high-speed dot matrix parallel printers to their system.

Being able to access a dot matrix printer, allows for the printing of high resolution graphics art that you can design yourself, special character fonts, variable line spacings, etc.

An addresser pin is also provided to permit the full use of memory expanders larger than 64K.

"ADDRESSER-CARD", by Orphanware. This card was designed for those not wishing to purchase a dot-matrix printer but who still wanted to connect a large memory expander to their ADAM. The card's pin allowed easy connection of the address-wire to the memory card.

"Multi-Purpose Interface Board", by Micro Innovations. This card gives ADAM a lot of power. It provides two of the industry standard RS-232 ports (one for an 80 column terminal and one for an external modem up to 19,200 baud!), one parallel port similar to the PIA-2 and an address connector for a large memory expander. This product provides the greatest expansion of an ADAM for the lowest cost per port.

"POWERMATE Hard Drive System", by Micro Innovations. This

hardware product is the ultimate in expansion for an ADAM. The interface card plugs into Port TWO just as did the cards listed above. The unit not only provides all the features of the Multi-Purpose card above, but also connects you to the POWERMATE Hard Drive unit.

A variety of configurations are available at this time from which you may choose.

Currently supported are systems from 10-meg drives on up to units with two 40-meg drives and two high speed floppies!

Floppy disk drives which can be connected via POWERMATE are available in 5.25" 320K, or 360K sizes or in the 3.5" 720K drive size.

The disk drives are capable of read and write operations to normal or enhanced Coleco disks but can't be used as boot drives.

You still retain the use of any datapack or disk drives you may already have connected to your ADAM by way of the AdamNET ports discussed above.

EXPANSION SLOT THREE

This particular port, located closest to the electronic "board section" of the ADAM console, was designed for the installation of a memory expansion card.

First in this line was Coleco's own 64K Memory Expander. A well built unit, the 64K card allowed ADAM owners to extend their SmartWriter workspace to double it's current size.

AdamCALC used the memory expander as a "print spooler". If you use AdamCALC, you already know that printing an AdamCALC spreadsheet on your SmartWriter printer will effectively lock out the ADAM from any other use while printing is in progress. On the other hand, a memory expander, if installed, will be recognized by AdamCALC the moment it is booted. When you get set up to print something from AdamCALC, the program will send your spreadsheet data to the memory expander it now considers to be a "print spooler". Once there, the "spooler" sends the file out to your printer as fast as the printer is able to accept it.

The ADAM is in the meantime placed back in YOUR control, and is ready to create or work with yet another spreadsheet.

Those who were able to purchase a copy of CP/M 2.2 were able to use the Coleco 64K Memory expander as another "disk drive" known as a RAMDISK. This ramdisk is used by simply moving to drive M: (for (M)emory expander). Files stored here could be accessed VERY rapidly without the need to wait for a disk or data pack to load it in. The T-DOS "user friendly" replacement of CP/M2.2 still allows the user to use this "super-fast" M: drive RAM disk.

"64K Memory Expander" by RVR Electronics. Soon after Coleco began to sell the 64K card, financial problems hit Coleco, and all of their hardware began a steady "phase out" by Coleco Electronics. In an effort to keep the memory expander available to ADAM owners, RVR Electronics did a superb job of duplicating the Coleco 64K card.

This was the start of production on ever larger memory expansion cards from the many other third party vendors and manufacturers.

"MX-64 64K Memory Expander" by Orphanware. This small card used less than one third the amount of components used by the earlier cards, and took advantage of replaceable ram chips. By keeping the part count down, the cost also dropped. This was the first product to provide a utility to diagnose itself; and later to gain EOS software support when EOS "COPY" utility programmers used the memory expander as a copy buffer for backing up ADAM disks or data packs.

"MX-256K and MX-512K Memory Expanders", by Orphasware. These units were made available with ram-chip sockets onboard. ADAM owners could purchase a blank board to which they could later add memory, as needs demanded or funds made possible. Those chips varied in price a great deal for a while. Any 64K increment could be purchased already built onto the expanders. Enhanced copy programs presently utilize these larger expanders, as does newer software; to extend the powers of SmartBASIC and other EOS software.

"256K MegaRAM Memory Expander", by R.& T. This is by far the most "state of the art" memory expansion card for the ADAM in terms of capacity. Built to resemble the Orphanware MX-256K cards, this version uses the newer high capacity SIP units for storage rather than the older ram-chips. Each SIP provides 256K of memory. The board will hold a total of 4 SIPs giving the ADAM a full 1 meg of ram-disk memory.

"OPA 64K Memory Card", by Oasive Pensive Abacutors. I make particular mention of this latest entry on the scene because of it's incredibly small price and size. This unit is only about 2/3's or less the size of the Orphanware MX-64K board. The designer of this board, Gary Bowser, told me he is using a different method of memory storage and that a 256K unit of similar size may be possible in the future.

T-DOS considers all memory expanders as ever larger RAM-Disks.

THE DATA DRIVE PORTS

Our final entry on "in console plug-ins" concerns the ports used to connect the digital data drive to the ADAM. After the console ventilation cover is removed to view the three internal expansion ports, as described above, it is possible to see the two cables running from your first original digital data drive. The point where they connect to the ADAM has provision for yet a second drive or other device.

"Coleco 2nd Digital Data Drive" by Coleco Electronics. This unit is exactly the same as the original drive installed in the ADAM at the time it was purchased, in fact they are completely interchangeable. Each "data drive" drives a DDP capable of storing a maximum of 256K of data. The addition of the second drive saves excessive wear on the original unit while doubling your storage capacity to 512K!

"Mega-COPY III & IV" by Syd Carter. This unit has to be one of the most original hardware units ever devised for the ADAM. Syd figured, (and rightly so), that the best way to create a true ADAM digital data pack was to do it the way Coleco did it: DIGITALLY! The Mega-COPY unit plugs into the jacks provided for the second data drive. Your second data drive then plugs into the Mega-COPY to complete the installation. The Mega-COPY allows the creation of true digital data packs from standard 60 minute audio cassette packs. Since it's the ADAM that uses these data packs, who would know better how to make one than ADAM?

THE SIDE PORT

On the right hand side of the ADAM console, just below, and behind the joystick ports, there is a little flip-up window. by lifting this window, you can see the SIDE PORT expansion bus connector.

A variety of units have been able to utilize this "card-edge" because it is an almost direct line to the Z-80 micro-processor. Many of the units originally manufactured for this port are no longer available due to their being discontinued by the manufacturers. Some of these units were among the most powerful ever designed for the ADAM. There was the RVR SP-1 Serial/Parallel Interface Unit, the RVR VD-80 80 Column Video Unit, the RVR SS-CC Speech Synthesizer/Clock Calendar card, the Orphanware 80 Column Video Unit, and the Orphanware RS-232 serial interface card. These units are still to be found for sale on occasion but are not readily available.

Coleco's only hardware item designed and sold for the side-port was the Auto-Dialer unit.

There is one NEW unit for the side port, however. A unit who's only competition lies in the world of the high priced IBM compatible world of 16 and 32 bit computers:

"The MIDI-MITE Interface", by Bonafide Systems. This unit is for all of the music lovers in the world of ADAM.

Designed by Chris Braymen, the MIDI-MITE makes it possible to connect a MIDI device such as a keyboard or synthesizer to the ADAM.

Supplied software makes it possible to play your favorite VideoTUNES music files on the ADAM but with a special enhancement: the music can be sent through the keyboard of a synthesizer instead of directly to the TV speaker, (or other auxiliary speakers, (which path it also supports).

By using the MIDI keyboard or synthesizer's own built-in ability to reproduce multiple musical instruments like flutes, pianos, or even drums, your VideoTUNES songs can "come alive" in up to 16 voices. Each voice can be a different musical instrument giving you have a small orchestra at your fingertips.

"MIDI format" songs that were created on other computer systems are also compatible when a program called MiniRECORDER, (also supplied), is used.

If you play the piano, you can also record your performances on disk or data pack (or even a hard drive) for future play-back.

II. THE INTERNAL MODIFICATIONS

These last few hardware devices which I discuss here, require the ADAM owner to open up his console to make the installation. Most modifications are simple and easy to perform, so don't be afraid to tackle any one of them.

"The Mini-Winnie Hard Disk Interface", by Advanced Concepts Design Engineering. This interface was originally produced for Kaypro, Morrow, Osborn and a few other Z80 CP/M based computer systems.

A persistently dedicated ADAM owner named Glen Smith convinced John Lingrel of Orphanware that the board could also work on the ADAM. It took months of hard work on John's part, and the development of special software by Tony Moreben and Guy Cousineau of AJM Software, (they also wrote the PowerMate software); to make the interface work.

At long last, the ADAM compatible hard disk was a reality! The way the card must be installed is by removing the Z-80 micro-processor from the ADAM's "game board", and soldering a 40 pin IC socket into it's place. When this is done, the Mini-Winnie board plugs into the socket and the Z-80 plugs into a socket already in place on the Mini-Winnie board. Current software will support up to 40-meg hard drives for ROS and Y-DOS programs.

"The SmartCLOCK Chip" distributed by Syd Carter. This small chip is easily installed after the console is disassembled and the game board removed.

What is left is the main "mother board" of an ADAM, the heart of the machine!

On the back right hand side of this board is a row of four chip sockets.

Three of these contain the chips responsible for holding ROS and SmartWriter. The fourth is usually empty.

Just plug the SmartCLOCK chip into that one empty slot and you can put the system back together. Nothing could be more simple! Supplied software permits date stamping ROS files and calling up the date and time under ROS or CP/M.

"The ADAM IMAGE MAKER (A.I.M.) BOARD", by Oasive Pensive Abacutors. The final details of this unit's installation are not currently known to me as it has only recently become available for purchase. A drive is currently on to create a library of supporting software for the unit.

The A.I.M. board will make it possible to connect VGA monitors to the ADAM for the utmost in high resolution graphics! The board uses the same video display chip as that found in the Sega GENESIS game machine so the graphics quality should be quite outstanding! Possible inputs are for a 3 button optical mouse, a direct video connection for VCR's, etc., and who knows what else. We'll just have to "wait and see" what the final version of this remarkable piece of graphics hardware will be like.

"The ADAM-Mouse", by Thomas Electronics. This unit is available in two different configurations.

The first is one that simply plugs into one of the joystick ports.

The second, requires a special interface to be soldered onto the back of the game board and an access hole cut into the ventilation vents on the lower side of the console.

Once it's installed, the mouse will work as a replacement for the joystick in many applications programs. The small modification to the air vents will be almost unnoticed.

Proposed software to utilize this mouse more fully are "ADAM specific" drawing programs, and even CAD programs.

THAT'S ALL FOLKS, BUT THAT'S A BUNCH!

As you can see, there is a vast quantity of hardware available to an ADAM owner who wishes to get more out of the system he or she already has.

If you belong to a user's group, you will then have a good line on where to purchase some of these items.

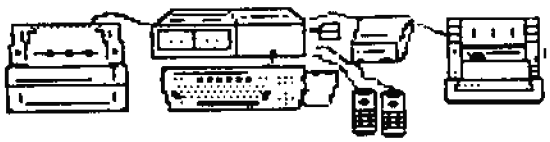
If you are a modem users, I recommend the ADAM bulletin board systems, even the commercial boards such as CompuServe and GEnie', as a source of information about upgrade hardware for the ADAM.

I know there is much more out there that I lack the space to cover, so, to the vendors who are supporting these products, I say my apologies.

Details on the many vendors who support the ADAM can be found in the advertisements, and names and addresses can be obtained from a perusal of the chapter entitled "DEALER ADDRESSES AND INFORMATION", of this conglomerate ADAM SURVIVAL GUIDE. I urge you to give them your continued support over the coming years.

Ron Collins

NOTE FROM THE EDITOR:
VENDORS; If any products have been omitted, it has not been intentional. As you must agree, Ron has done an excellent job with this article. Send any information that you wish publicized to ANN, the address of which organization appears in various places in this ASG.



ADAM MUSIC WITH A MIDI

by Chris Braymen

The "read-me" file that accompanied the song I had just downloaded read like this:

> Londonderry Air was first collected by Jane Ross from a fiddler in Limavady Co. Londonderry, N. Ireland. It is one of the most famous Irish melodies. This rendition has been recorded by Cathy Trimble who resides in Limavady. She is in the United States for a short holiday. Please let me know how you like her song. It uses a piano sound.

I turned on my synthesizer, booted my MIDI program, and loaded the song file. I selected a piano sound on my synth, (synthesizer), and pressed the "PLAY" Smart Key on my ADAM computer. What came out of my synthesizer was simply the most beautiful version of "Danny Boy" that I've ever heard!

As I listened, I marveled at the technology that had enabled the performer to record this song in such a manner, that I and others were able to download it and enjoy it. And we can enjoy it, not as a series of computer-like "beeps" and "boops", but as real music, recreated on my keyboard with all the feeling and nuance of the original performance.
"MIDI", stands for Musical Instrument Digital Interface. It is a hardware and software protocol for communication between synthesizers, computers, or any MIDI equipped device.

Unlike digital recording and sampling which record and playback the actual waveforms of a sound, MIDI devices send and receive "MIDI events" that carry information about HOW a certain musical event was produced and how to recreate it.

For instance, when you press a key on your synthesizer keyboard, the synth sends a "Note On" event that carries information about which key you pressed (note), and how hard you pressed it (velocity). When you release the key, the synth sends a "Note Off" event telling which key was let up, and how fast you let it up. Thus, Note-On and Note-Off events describe the physical actions that produced a specific musical note, played with a certain "touch".

(It is important for those unfamiliar with the "language of the MIDI world" to note here, that the word "event" in the phrases "MIDI event", "Note On event", "Note Off event", etc.; might as well have been called "information data" or "information stream", or some other thing else. Please don't get a mental block because of the choice of words. This is what they call it, and that is all that there is to it! It could have been called "stawberry jam and peanut butter sandwich" but it wasn't. It was called an "event")!

There are many different types of MIDI events that describe a wide variety of musical actions. Pressing the sustain pedal down causes a MIDI event, as does changing the keyboard's volume or changing the instrument (a function that is determined in the program). The wide variety of MIDI events allows for an immensly detailed description of the actions that have created a particular piece of music.

Synthesizers not only send MIDI data, but they also receive it and will carry out the instructions contained in a MIDI event received by it. So, if we somehow send a Note-On event to our synth, it will play the note just as if we had pressed a note on our keyboard!

Using a MIDI-equipped-computer, we can send any kind of event we want to our synthesizer! If we stored all of the MIDI events transmitted by a synthesizer in the computer, and then sent them back to the synth in the proper order and with the proper timing; you would hear the computer "playing" the synth just exactly the way the synth was played during the original performance! This is called "sequencing". The computer program that performs these actions is called a "sequencer".

SEQUENCERS

Sequencers can do much more than simply record and play back MIDI events. Using the computer's unique ability to manipulate data, we can change any of the data relating to the musical performance.

For instance, if you hit a wrong note while recording, you can edit the Note-On event to reflect the correct note.

Or perhaps you wanted to play a certain note a little louder, you can edit the note's velocity to do just that!

Perhaps you think the flute part would sound better played on a bagpipe. Change one number and give it a listen... no... bagpipe doesn't sound quite right. How about a clarinet?... Change the number again... yeah, that's it! Many happy hours can be spent listening to music and changing the sounds

around until you find the one combinatioo of instruments that feels "just right".

The sequencer becones like a word processor for music. You can delete events or insert them. You can move or copy whole chunks of a song, change the tempo, transpose an area to a new key, even change the position in the stereo field of a certain instrument if your synth supports "PAN" events! "Honey, could you move that French Horn player about 15 feet to the left?". "Yes, dear". Change, one number and it's done! A sequencer lets you assemble and conduct your own personal orchestra!

STANDARD MIDI FILES

There are sequencers available for many different computers, with a large percentage of MIDI users owning Macintoshs or PC compatables.

Until a few years ago every sequencer saved sequences in its own file format and there was no compatability between sequencers. This meant that you could only share your sequences with those people who had the same kind of computer and sequencing software.

This changed in 1987 when the standard MIDI file format was introduced. Now, most sequencers have the ability to read and write standard MIDI files. Consequently, a file created on an Atari can be read by a sequencer on an Amiga or ADAM or any sequencer that supports standard MIDI files.

What this means in plain English is that there are hundreds of sequences available for downloading on BBS's and information services that you can play with on your ADAM. And it doesn't matter what kind of computer originally created the file!

It also means that if you create a song that you feel inclined to share with others, you can upload it in standard MIDI format, and people with IBMs and Macs can download it and play it back!

Many ADAM user groups and retailers have compiled disks of public domain MIDI songs that are available very inexpensively. I have even heard of one prominant ADAM user who has amassed several Megabytes of MIDI files and is still collecting!

SYNTHESIZERS

Now that you're aware of the vast musical potential of your ADAM, you're probably itching to run out and buy a synthesizer, right? <grin> But which synth should you buy?

In general, the more features a synth has, the higher the price. So the trick is to figure out which features you need and which you can live without. Actually, it would be difficult to buy a MIDI synth that wouldn't be fun to play with, so if the following discussion bores you, don't worry, be happy!

All synthesizers include a "MIDI Implementation Chart" with the documentation. It is a standard form that details exactly what features this particular synth has. The chart is a standard size so you can place the Implementation Charts from two different synths side by side to compare features. What follows is a discussion of some of the features that you might look for when purchasing a synthesizer.

MIDI MODE

For sequencing you need a synth that responds to multiple MIDI channels concurrently. This means that you can have a trumpet on one channel, and a harpsichord on another, both being played at the same time by the same synth. This type of synthesizer is sometimes called "Multi-Timbral".

On Implementaion Charts the multi-timbral mode is referred to as "Mode 3 - Omni Off, Poly". Never mind the non-musician like language, it just means that you can play two or more instruments at the same time!

A synthesizer like the Yamaha DX-7 is a very nice synth but was designed to play only one sound at a time. It is not a multi-timbral synthesizer. The Roland MT-32, on the other hand, was designed as a "desktop orchestra" and will play up to nine different instruments simultaneously. The CASIO MT series and the new Miracle Keyboard for the Nintendo are also multi-timbral synths.

VELOCITY, PITCH BEND and AFTERTOUCH

Velocity, Pitch Bend, and After Touch are aspects of keyboard performance that not all synthesizers support.

Velocity is a measure of how hard you press a key down. Synths that support velocity will respond by playing notes with "high velocity" louder than notes with "low velocity". Since piano player, for example, never play each key with exactly the same amount of pressure, a synth that supports velocity will sound more natural than one that doesn't.

Pitch Bend is usually implemented by a wheel or joystick on the synthesizer. When you push the wheel forward, the pitch of the current note is bent upwards. When you push the wheel down the pitch is bent down. Synths that support pitch bend can more easily create sounds like a "dixieland" trombone or "rock & roll" guitar or slide whistle.

Aftertouch is the least common of these three "optional" MIDI

messages. It is used to change the vibrato of a note while it is being played. If you play a note and hold the key down, then you press even harder on the key, aftertouch events are sent and the vibrato of the current sound is altered according to the amount of pressure on the key. More pressure gets more vibrato.

CONTROLLERS

A controller is another type of MIDI event used to "control" the sound of a synth. There are 127 different controllers so I will not try to explain all of them! The mains ones you'll be interested in are:

Controller #7, Volume
Controls the volume of a channel. If your synth responds to volume controllers you can use them to "mix" your music. So if the Bass sounds too loud you can make it softer without having to change each note's velocity

Controller #64, Sustain Pedal
Used to control the state of the sustain pedal. If the sustain pedal is down, notes that are played will continue to sound after it's key is released. When the pedal is up notes only sound while their key is depressed.

Controller #10
Pan Controls the stereo balance, (PAN), of a channel. So if your synth can play eight instruments at a time, each instrument can sound like it is coming from a different place in the stereo field.

Hopefully this gives you an idea of the kinds of features available on synthesizers. What you buy will depend on which features you want and how much money you want to spend. (But you didn't need me to tell you that!).

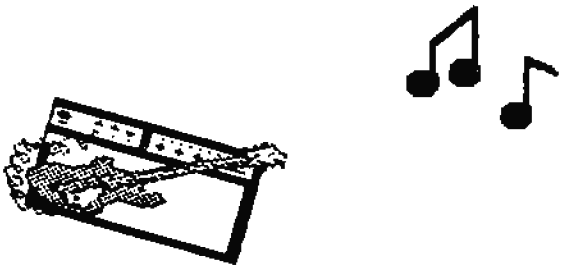
Now perhaps, you can see that MIDI is simple enough to use, that the least expensive synth can be very enjoyable to "play with"; yet MIDI is sophisticated enough to be an excellent tool for the most demanding professioonal composer.

After listening to "Danny Boy" several more times, I sent a note to the person who uploaded it telling him how much I enjoyed the song and asking him to please thank the girl in Limavady Ireland who recorded it.

Thanks to the generosity of people who create and upload music for all to enjoy, and the wonderful computer technology that has enabled us to communicate with people in distant places, even in forms like music; the world seems like a smaller and nicer place!

Chris Braymen

EDITOR NOTE:
Chris Braymen is composer and MIDI expert for "Sierra On-Line"; a company that makes computer games to go along with their music. The rest of Chris' life is spent feeding cats, building Bonafide Systems MIDI interfaces, and writing MIDI software for the Coleco ADAM. See the forward section of ASG, "IMPORTANT NAMES AND ADDRESSES" for Chris' address if you would like more information. It is listed under suppliers, as well as independently).



ADAM SERVICE AND REPAIR

by Phil Kosovski

My Adam's broken, what do I do? Well you can call Kosovsky's Adam Repair or try to fix it yourself. This chapter will cover maintenance and simple trouble shooting for the Adam CPU and printer. I'm keeping this simple because the average Adam owner knows very little about electronics.

MAINTENANCE SECTION

THE CONSOLE

The Adam computer console requires very little maintenance. Just remember the old saying "If it ain't broke don't fix it". Other than keeping the Adam clean and dust free the CPU requires no maintenance at all!

THE DATA DRIVE

The data drive only requires routine cleaning of the read/write head. The read/write head is the metal block at the bottom center of the data drive. Cleaning is done by placing isopropyl alcohol on a cotton swab and lightly rubbing the brown residue from the tape head.

THE ADAM PRINTER

The only maintenance the printer requires is to clean the guide bars with a soft cloth sprayed with silicon. The guide bars are the two chrome-plated bars on which the printer head moves back and forth. If the printer starts to squeak when the printer head moves, try spraying some silicon on the shafts upon which the pulleys are mounted.

REPAIRS SECTION

The best way to fix the Adam, like any other electronic item, is to isolate the problem. The best way to do this is by swapping parts with known good parts when something stops working, works improperly, or works with suspicious noises.

This section will assume that you have swapped the printer, CPU, etc., (whatever is logically necessary), and know which part is defective. If you don't isolate the problem, you might end up trying to fix a part that you think is broken but is not.

PRINTER REPAIRS

Various symptoms of printer problems are:
- roller continuously advancing,
- no ribbon advance,
- not printing,
- no picture,
- no roller advance,
- printing head traveling right at start up,
- prints garbage,
- prints garbage only when warm,
- daisy wheel spinning forever,
- noises, and
- printer locking up during printing.

I would like to cover some general things first, like how to check start up sequence, power supply voltages, printer self-test, etc. The start up sequence for the Adam printer should be as follows:

PRINTER INITIALIZATION

1. Printer head should move all of the way to left side of the printer, and stop.
2. The daisy wheel should spin to home position.
3. The platten roller should advance one line.
4. The printer head should then move to the right about one inch.

Power supply voltages:

(Get a male 9 pin D connector and plug this into the "computer end" of the Adam power cord. Turn power on and measure the voltages).

Voltages should be:

Pin 5, is negative;
Pin 4, -5;
Pin 3, +5;
Pin 2, +12;
Pin 1, +12; and,
between Pins 6 & 7, is the Adam net = +5 volts. (Pin 7 is negative relative to pin 6).

PRINTER SELF TEST

There is a self test feature on the printer which tests some of the printer circuits. To use this;

turn off the printer, and
remove the cover revealing the printer logic board.
Short out E8 against the RF shield with a metal object like a screw driver, knife, etc. (You will find E8 on

the printer logic board near the front corner of the transformer and RF shield).

Turn on the printer and remove the screw driver. If working properly the printer will type all characters on the daisy wheel. The printer will keep printing in this fashion until the power is turned off.

FAULTY PRINTER LOGIC BOARD

Most of the time when a printer does not work properly it is because of a faulty printer logic board. Just about any problem that can exist in a printer, can be caused by the printer logic board.

If this board goes bad, or something else in the printer goes wrong which does not let you operate the electronic type writer; you can still operate the computer by just un-plugging the four pin connector that connects the power supply board to the printer logic board.

CAUTION! (Make sure you unplug the printer before reaching into the printer to un-plug the board).

PLATTEN ROLLER ADVANCING

If the platten roller on the printer keeps advancing when the printer is turned on;

take the top cover of the printer off, and

check the switch inside of the gear train. Most of the Adam printers have contact points in this gear train which tend to break after awhile.

If the contact points are not broken then you need to replace the printer logic board.

NO RIBBON ADVANCE OR LIGHT PRINTING

If there is no ribbon advance or light printing;

first remove the ribbon and watch the printer advance mechanism while printing something.

If the plastic "cross" that advances the ribbon does not turn, then the problem is most likely in the printer logic board, but may be in the printer head.

If the advance works, the problem is in the printer ribbon. Try advancing the ribbon by hand while it is out of the printer, using the knob on the top of the ribbon.

If the ribbon is hard to advance, first remove the rubber "O"-ring and then open up the ribbon cartridge. Use a thin piece of metal like a dull butter knife. This is done by placing the butter knife just a short way under the top cover, and moving it around the cartridge until it encounters a plastic pin. In the region of the plastic pin, pry up a little. After the cover has separated a little, work the butter knife along to a different area seeking another pin, etc.; and keep repeating until the cover is off.

Look for any broken parts inside of the cartridge. If all appears to be OK, cut and remove the ribbon from the left spool, (the take-up spool), and throw the used ribbon away, but retain the spool. Then splice the free end of the unused ribbon from the right spool onto the left spool, using some tape. Wind the ribbon around the left spool a couple of times, and then replace the top and "O"-ring. Try advancing the ribbon with your hand to make sure it turns freely.

NO PRINTING

If "no printing" persists, most likely the problem is in the printer logic board, but it also may be in the printer head itself.

NO PICTURE

If there is no picture; check the power supply voltages. If voltages are not correct replace the power supply.

NO PLATTEN ROLLER ADVANCE

If there is no platten roller advance; most likely the problem is in the printer logic board. But it also may be caused by the motor on the gear train not functioning.

PRINT HEAD TRAVELS RIGHT AT START-UP, OR BUMPS LEFT SIDE

If the printer head travels right, or bumps against left side of the printer when it is turned on; check the switch which is located either on the left side of the printer head, or on the inside left side of the printer.

This switch should normally be closed, and the printer head opens it when it comes across, (as described above).

If this switch is a set of contact points, bend them so they will be closed, and will open when the printer head comes across.

If the switch is a micro switch, check it with an OHM meter and replace it if it is faulty.

If the switch is not the problem, check the lead wires to it for continuity.

If neither the switch nor the lead wires are the problem, then you need to replace the printer logic board.

(If travel of the printer head is not smooth, most likely the problem is in the logic board).

If not, it may be the printer head itself.

It is very unlikely that the printer head motor is bad. I have fixed over two hundred Adam printers and I have not ever seen even one of these motors go bad. For the people that do

not believe this and buy them anyway, I have plenty for sale!

PRINTS GARBAGE
If the printer prints garbage when cold, or only prints garbage when warm; replace the printer logic board.

DAISY WHEEL KEEPS SPINNING
If the daisy wheel spins forever: one of two things can be the cause;
either the motion sensor in the printer head is bad,
or the printer logic board is bad.

I would try replacing the printer logic board first. It fails more often than the motion sensor.

NOISES, HUMMING SOUNDS
If noises such as humming or buzzing come from inside the printer; well there are three things to check, any one of which might be the cause.

1. The transformer shield might be too close to the transformer. This will cause it to vibrate when the transformer is under heavy load, making a buzzing noise when the printer is first turned on.

To fix this, **UNPLUG THE PRINTER**, then bend the shield forward. Be careful not to bend it too far forward, or the printer head will get caught on it when moving back and forth.

2. Another possible cause of this type of noise, is loose screws.

Remove the power supply chassis and check the four screws that hold down the transformer.

If the screws are loose the transformer will make a humming noise.

All screws on the power supply chassis should be locked with a sealer after tightening. This is done so that the screws do not vibrate loose when the transformer vibrates when the power is turned on and off. I found finger nail polish works well as a sealer.

3. The third thing that can cause a buzzing noise is a shield on the back side of the power chassis. If the parts under the shield are too close, they will cause the noise.

With the power supply **UNPLUGGED**, take off the shield and move or tape with electronic tape any part that is too close to it.

PRINTER LOCKING UP DURING PRINTING
If the printer locks up during printing; it is caused by the gears in the gear train not meshing all of the time. If this happens, turn the roller backwards at least a quarter of a turn. This will unlock the gears and allow you to print. If this problem happens often, replace the gear train.

CENTRAL PROCESSING UNIT (CPU)
otherwise known as the memory console.

The various types of common problems that can occur with the CPU are:
error readings,
no screen,
no sound, or
defective screen,
ADAM printer does not print screen, and
keyboard will not display characters on screen.

ERROR READING
When getting an incorrect read error, first clean the data drive head, and follow that by trying to store some data on a NEW tape. If the problem persists, check the tape drive speed setting, using either speed tester V1.0 or speed tester V2.0. Both of these software programs are available in the public domain.

The speed adjusting screw is located on the bottom of the drive for both the US and old style JVC drives. The speed adjustment screw is located on the top of the drive for the new style JVC drives.

If you still have a read error, then the problem is either in your data drive or in the CPU. The only easy way to tell which of the two is the defective part, is by swapping the data drive with a known good drive. If this solves the problem, then the CPU is not at fault.

If however, the problem is in the CPU you will have to open up your CPU, remove the metal shields, and try storing again.

If this fails, the next step is to leave the metal shields removed; and try, (one at a time), removing the socketed chips on the logic board, (bottom board); then replacing the chips back into the same sockets. Try storing on the known good drive with a new tape.

If you still get an error reading, give up and send the CPU to get it repaired. Further attempts at repair are beyond the average persons ability; and buying special chips, and taking a stab at maybe fixing the problem, is not economical.

NO SCREEN, NO SOUND, DEFECTIVE SCREEN
If you have no screen; try unplugging the tape drive from the CPU. A shorted out tape drive or a tape drive plugged incorrectly, can blank out the screen.

If you have no sound, no screen, or defective screen; first check the voltages of the power supply.

If OK, then open up your CPU, and remove the metal shields. Then power up your CPU. If your problem is solved, then what happened was that something was shorted on a shield. Put the shields back on so nothing is shorted and try again. Keep adjusting the shields until the shorting problem is eliminated.

If, without the shields, the problem still exists, then try swapping your boards with known good boards, to determine in which board the problem is located. Most likely a "no sound or defective screen" problem will be in the game board (top board).

"No screen" can be in either the game or the logic board. With "no screen" try removing socketed chips and replacing them back into their sockets one at a time, (as done above). Then try powering up the unit; and if you still have the problem, send the CPU in for repair.

ADAM PRINTER DOES NOT PRINT SCREEN

If the printer does not print to the screen; first unplug the keyboard cable from the CPU jack to which it is connected, and connect it into the other keyboard cable jack on the CPU. (A jack is what a plug plugs into. One jack is on the front right lower section, and the other is on the left center lower section).

If the CPU will still not print the screen, take apart the CPU and try printing the screen without the shields, as was done with the above described problems.

If the CPU still does not print, send in the CPU in for repair.

KEYBOARD DOES NOT PRINT TO THE SCREEN

If you have a screen but it will not print; first unplug the keyboard cable plug on the CPU, and try a new cable.

If this does not work unplug the cable and look at the keyboard jacks on the CPU and keyboard itself. (Remember, a jack is the hole that receives a plug). What you are looking for is to see if the wires in the keyboard and CPU jacks look OK, or if they are bent or broken. If the wires of any connector are not OK, replace the connector.

TESTING

After a repair is made, the item should be tested.

If it is a printer, just see that it functions correctly. Leave the printer on for three hours. Then check to see if it still functions correctly. This is done to see if there is an over heating problem in one of the boards.

For the CPU test it is a little more complex. The menu test, the one hour burn in test, and VRAM test should be used for complete testing. These are tests that Coleco developed and are in the public domain.

First run through the menu test, and
then the one hour burn in test.

If these tests are passed, run the VRAM test.

One last test is required, which is that of attempting to store a file on a blank tape. For some reason the menu and one hour burn in test do not completely or correctly check the storing of data on blank tapes.

EDITOR'S NOTE:

The parts mentioned in this article are available from the suppliers advertising in this ASG. See particularly the ad of the author.

(See "IMPORTANT NAMES AND ADDRESSES" in this ASG).

MAKING LOW TECH HARDWARE

by Jerry Vrant

THIS CHAPTER CONTAINS TIPS AND HARDWARE THE AVERAGE ADAMite CAN MAKE WITHOUT ANY SPECIAL SKILLS OR TOOLS.

FROM ERIC DAHZ'S
ADAMICOM Publishing Company
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FILE: HANGER-TRICK

What can you do if you don't want to spend money for an ADAM compatiable tractor feed for your SmartWRITER printer?

The answer is very simple. First obtain an ordinary household coat hanger, make sure it's an all metal one and not the type with a cardboard base. You'll also need a pair of pliers and wire cutters. Now you can begin to construct an ordinary and very economical tractor feed for your ADAM SmartWRITER printer.

Follow the instructions below carefully or you will wind up with a bunch of useless wire and you'll have to try again.

1. Unwind your metal coat hanger at the hook.
2. Straighten your coat hanger out as much as possible with the pliers so as to make it into a long piece of straight wire.
3. With a ruler, measure one inch in from either end of the wire.
4. Still with the pliers, make a 90 degree bend at the one-inch mark. You should now have a long piece of metal with a little "L" shape at the end.
5. Take the ruler again and measure from the bend, a whole 9 1/2 inches and make another 90 degree bend at that mark, in the same direction as that of the first bend. You should now have a one inch bend and a 9 1/2 inch bend with a long extra piece left over.
6. On the piece left over measure another one from the bend toward the end of the left over piece. At the one inch mark, cut with the wire cutters.

You should now have a metal piece 9 1/2 inches long with a one inch "L" bend on either side. This is your tracor feed.

Take your new piece of hardware and place it in the holes located on the dark grey section of the ADAM printer housing. Be sure to leave at least a half an inch room between the plastic and the metal. This is where the paper slides through before it enters the roller part of the printer. Keep the paper release engaged so as to get friction. Your paper should slide under the hanger into the roller and out the top for a continuous flow of form feed paper accomplishing the same task as a commercialy available Tractor Feed.

Added Note:
Make sure the paper does not cover the air vents on the back of the printer.

PAPER TRACTION

The following is an excerpt from an article written by Don Zimmerman that appeared in the MIAD newsletter # 34 (Oct. 87).It does help the traction when using fan fold paper.

Remove the printer's cover and place one (3) three inch (unstretched) rubber band on both the left and right hand sides of the cover. Replace the cover. It only takes a second to lift the rubber bands and stretch them over the tabs that stick up on the paper hold down bar. Lift them off when the bar must be raised for paper adjustment.

COMMON DISK DRIVE PROBLEMS

The following summary is from the March 89 MIAD Newsletter, ADAM MAINTENANCE, written by Lyle Marshand. (A very good article on ADAM maintenance).

The most common problem with disk drives are the problems that are due to wear and tear on the drive mechanism itself. If this turns out to be the problem, the drive will need to be sent out for repair. But first try cleaning the read/write head with a wet/dry drive head cleaning kit, this should be done every few months or so, depending on the amount of use the drive gets.

DID YOU KNOW
By RICK LEFKO
April 89 MIAD

If you have a single-sided disk drive, you SHOULD keep the door closed to guard against dust, but if you have a double-

sided drive, you should NOT close the door unless you insert a disk in the drive. (Leaving the double sided drive open keeps the heads from knocking each other around).

DISK THAT JUST WON'T FORMAT
By Thomas J. Keese, IEAUG

I have had a few, (very few), disks that were "magnetically" trashed in some manner and had to be reformatted. But they refused to format, returning a diagnosis like "Bad Block" or "Missing Block". Absolutley nothing would persuade ANY formatting program to cope with those disks! I hate to lose a disk, unless it is completely hopeless.

In my experience I have never encountered a disk with a truly bad block. By "bad" I mean that there is some sort of missing magnetic material or something that just won't accept data. I have encountered an occasional disc that that acts "bad" but it has always turned out that I could salvage it.

These obstreperous discs will show up with bad blocks in testing them with BACKUP+, JKL Utilities, DU-V87 and FileManager. I tried to format them with the Coleco Disk Manager, JKL, and several other formatting programs with the identical results.

The solution I found was to bulk erase the offending disk with a high powered video tape bulk eraser. This knocks the disc back into sensibility. It forgets everything that it ever had recorded on it. After this treatment, it can be readily formated.

FILE RECOVERY TIP
This is an excerpt of an article written by Carl Fenning that apeared in the June 1989 issue of TOGGLE.

Carl states he recieved some damaged diskettes. (The magnetic media would not rotate within the sleeve due to the edges of the sleeve being crushed). He wrote the following.

"While waiting for replacement diskettes, I wondered if it would be possible to copy the diskette by removing the magnetic media from the sleeve and inserting them into another, undamaged sleeve. I did so by cutting open the flap os the back of the diskette on the end oppsite the exposed slot. Using a small piece of folded paper to grasp the magnetic media, (so that my fingers would not touch the ssrface), I pulled the media out of the defected sleeve and slid it into another sleeve. The new sleeve was prepared similarly, except the flap was cut off completely and cleanly, to prevent jamming in the disk drive.

With the magnetic media from the defective sleeve inserted into the open ended sleeve, the files on the disk copied without error. Even a diskette from a crushed diskette cover can be saved in this manner.

MODEM TIPS
By no stretch of the imagination am I an expert on the use of a modem. But I thought I would pass along a few problems I had when I first started using mine, and the solutions that I found thereunto.

First, at our home we have call waiting, (heaven forbid my wife should miss a phone call), and it seemed like every time I used the modem someone would call and that little beep would knock out my modem transmission.

I tried talking my wife into doing away with call waiting, (that was a no go).

I checked into the cost of a separate phone line. For no more then I use the modem, the cost wasn't worth it.

I talked to the phone company explaining my problem,they had the answer. They have a service that will cancel out call waiting before you make a call. The cost is a round $2.00 a month.

Now I can use the modem any time I like without the fear of someone calling and interrupting my transmission. Your phone company may have the same service.

Then there was the other problem. I would tell my wife not to use the phone untill I was through with my modem call. But on a few occasions she forget. "WHAMO" off line again.

When looking through a Radio Shack catalog I saw a device that would stop this from happening. If someone tries to use the phone during a modem call it doesn't isterrupt the transmission. It's called a Teliprotector Voice Data Guard, cat.# 43-107, for $7.95. It also stops interruptions of fax transmissions.

I installed it on the phone that my wife uses most. It works!

If you want to be totaly protected you'll need to install one on each phone. One other thing I did at the suggestion of the phone company was to run a separate shielded phone line from the outside terminal box to my ADAM.

If you're having any of these problems perhaps one of the suggestions would help.

PROTECTING ADAM

There are a couple of things you may want to consider hooking up to your ADAM.

The first is an electrical surge protecter. This device will stop electrical power surges from damaging your ADAM. A power surge could be caused by the utility company or a near-by lightning strike. It plugs into the electrical outlet, you then plug the ADAM and other equipment into it.

Second, if you have a modem you may want to install a phone line spike protecter. This prevents any electrical surge from entering the computer via the phone line during an electrical storm. This device plugs into the same phone line as your modem.

Neither device requires any modification to the ADAM.

While I'm on the subject of electricity there is one other thing you should check. Make sure your ADAM is plugged in to a properly grounded electrical outlet. A bad ground can cause ADAM to do all kinds of weird things.

After loosing a VCR and TV due to a near-by lightning strike, I'm now in the habit of unplugging my ADAM whenever severe electrical storms are nearby.

KEEPING YOUR ADAM "KOOL"

It has been said that HEAT is ADAM's biggest enemy next to PIRATES. Here are some suggestions and tips you can use to help reduce the heat problem. (Pirates should be made to walk the plank.)

From the very begining I have used some means to improve the air movement around and through my ADAM. It's a proven fact that heat causes eleltrical components to weaken and break down sooner. So the cooler you keep your ADAM the longer it will function. (NO don't put it in the refrigerator).

Some of the suggestions are just common sense, some are very simple,and some are more elaborate.

First, don't block or restrict the air vents. Give ADAM plenty of room to breath, about four (4) inches on all sides. Don't push the printer or CPU against a wall or put it in a confind area.

Make sure the little rubber feet are still in place. You may want to consider attaching thicker feet for even better air movement.

Don't set the printer,CPU or disk drive on a table cloth, etc., this could restrict air movement.

If you want to install thicker feet I found that self sticking door gasket material works just fine. Also if you are using computer fan-fold paper in the ADAM printer, make sure it doesn't block the air vents on the back side of the printer.

The next thing to consider is the use of a fan to direct some air movement around ADAM. You can use any type fan, I read somewhere that an ADAMite used a ceiling fan installed above his computer desk for air movement. I prefer a small muffin fan, they are small, quiet, and inexpensive.

A suggestion for keeping the data-drives cooler was given by Rick Lobbestael in his article that appeared in the MIAD Nov. 1990 Newsletter.

Rick states you can greatly reduce the heat build up in the data-drives by removing the data-pack when it's not going to be accessed for a time. The data-drive motors keep a small amount of tension on the tape when it's not in use, and this produces heat.

Another cooling scheme about which I remember reading somewhere, was where an ADAMite left the Data-Drive doors open when the tapes were not being accessed.

Someone else removed the top access panel on the CPU for better air movement. Rather than removing the cover, prehaps air vents could be cut in it.

What I have done to keep my ADAM "KOOL" is somewhat more elaborate. I made a plexiglas enclosure for the ADAM printer, a metal enclosure for the power supply, and a stand for the CPU for better air movement. They all have a filtered fan set-up that forces air through them.

I'm also working on a more simple set-up for my disk drive.

The one for the ADAM printer is the most elaborate. It keeps the printer cool, cuts the soise in half and is a permanent dust cover. IF you think you may be interested in any of these cooling units, send a SASE and I'll give you more details. (Find address for Jerry Vranck in the "important NAMES AND ADDRESSES" in this ASG).

Perhaps you have never experienced an over heating problem,

or perhaps you have and not recognized what it was. Did you ever have a problem getting a program to load, get strange symbols on the screen, or lose the sound when using SMARTWRITER? These symptoms can be caused by HEAT.

Keeping your ADAM "COOL" will increase it's longevity.

A MORE CLEAR PICTURE

The following is a summary of the article "BLURRY-EYED" written by Bob Slopsema that appeared in the Dec. 1990 MOAUG Newsletter.

Bob found a way to greatly improve the picture from your ADAM when using a TV.

First you'll need to go to your local Radio Shack and purchase the following. 1- signal booster # 15-1118, 1- 4' coaxial cable # 15-1529 and 1- 1 1/2' RCA to RCA computer cable # 42-2365.

The objective is to end up with two cables with an RCA computer plug on one end of each, and a coaxial (F) plug on the other end of each.

First, cut both cables in half.

Next solder the center wire of one RCA cable and the center wire of one of the coaxial cables together, and tape well for insolation purposes.

Then solder the outer casing wires together, and tape that connection.

Make two cables this way.

Plug one RCA end into the CPU TV port, then plug the coaxial end into the input port of the signal booster.

Plug the second cable coaxial end into the output port of the booster and the RCA end into the game/computer adapter switch on the TV.

If you are somewhat squeamish about soldering Radio Shack sells a female RCA to male (F) adapter. By using two of these adapters you can use two RCA computer cables to hook up the signal booster, but doing it this way the cost is a little more.

I made and use this set-up on one of my ADAM's and the picture is as good as my other ADAM with the monitor. I get a $300 picture for less then $20.

REMOTE RESET and CABLE EXTENSION

A while back I was confined to bed, but I was well enough to want to play with my ADAM. After getting ADAM moved as near the bed as possible I still had two problems. The keyboard cable was to short and I couldn't reach the reset switch.

I solved the keyboard problem by connecting two cables together with a six wire phone line connecter.

The reset problem was a little more difficult. I removed the CPU cover so I could get to the reset switch to see what made it tick. I found that it was a no/nc switch with two wires hooked to it. I then made and installed a remote reset switch.

I had no idea anyone else would have a need for a remote reset switch until I read that Dean Roades was looking for a way to wire one up to his keyboard. I couldn't wire it up to the keyboard but I showed him what I had done and how to wire it.

If you think you may want to install a remote reset switch to your ADAM there is an article in the Oct. 1990 A.N.N. disk and the Oct.1990 463 ADAM Newsletter (the newsletter has the wiring diagram). Or send me a SASE and I'll send you the parts list and wiring diagram.

When Dean Roades was getting the parts needed for the reset switch he ran across some other parts you can use to make longer disk drive and keyboards cables. He found the following at Radio Shack; 6-wire modular line cord #279-423, crimping tool #279-388 and modular connectors #279-421.

** AS with all modifications, there is a risk of damaging your ADAM. ASG, ANN, 463 ADAM or anyone associated with them accept no responsibility for any damage to your computer.

MODIFYING AND RELOADING ADAM RIBBON CARTRIDGE

Nat Eisman

In the course of my work as a freelance writer (science, techology and medicine if anyone out there uses freelancers, unp'd. ad.), I have found that print quality on the ADAM printer using Coleco ribbons leaves something to be desired; and, like everyone else, I also have had difficulty finding them.

However, I found through a bit of experimentation that a slight modification of a ribbon cartridge will provide darker and a more even intensity output than one receives from the original Coleco set-up. The process involves opening the ribbon cartridge, and once the ribbon cartridge has been opened to make the modification, a used ribbon can be easily

replaced with a new ribbon, and the cartridge re-used. Thus the opening of the cartridge presents two avenues of solving the ribbon problem; either fixing the old ribbon, or eventually replacing it. Either way, it is much less expensive than the purchase of a new cartridge, even if one can be found to purchase.

MODIFICATION OF A PARTLY USED CARTRIDGE

To modify the cartridge, first remove the O-ring from the spools on the left side and save it aside. Then use a small thin bladed knife, and working slowly around the edges of the crack in the sides of the cartridge, gently and evenly pry off the top.

(Don't worry if you break a few of the pins. There are six of them and if any two of them survive the process, they will suffice).

Then lift out the feeder ribbon spool on the right hand side and remove the tension spring from the underside and discard the spring. (This spring maintains unnecessary ribbon tension, which causes drag and uneven printing darkness).

Replace the feeder spool.

Now, looking at the left side, you will see that the ribbon is threaded through drive sprockets. (One of these often pops out when the cartridge is opened so be careful not to lose it).

Break the ribbon somewhere between the feeder spool and the take-up spool.

Remove all of the ribbon on the take-up spool, an discard the ribbon.

To re-thread the ribbon from the feeder spool on the right to the take-up spool on the the left, I recommend by-passing the sprockets. This allows the ribbon to run faster and farther with each hammer strike than is done otherwise. And therefore a fresh part of the ribbon is placed in front of the daisy wheel each time a character strike is made, which improves printing quality.

Attach the free end of the ribbon, (coming from the feeder spool), to the take-up spool with a very small piece of tape. Then reassemble the cartridge and go for it.

This does use up the ribbon somewhat faster, but now..... next... :

you now need to know how to reload the cartridge with fresh ribbon!

REPLACING AN OLD RIBBON WITH A NEW RIBBON

With the cartridge case opened as described above, lift out the old ribbon from the take-up spool on the seft side, and discard it; BUT SAVE THE TAKE-UP SPOOL!

Remove the old feeder spool entirely, and discard that.

Insert the new ribbon on the "feeder spool" spindle on the right side, and thread as above; again using tape to attach the free end to the takeup spool.

RE-assemble the cartridge, and go to it again!

Note: When the cartridge is assembled, just prior to placing it into the machine, the feeder spool just sits loosely in the cartridge. It will rattle around as you handle it and may seem to jam a bit, but once it is in the machine it will work fine. (I have printed about 3000 pages of text over two years this way without a single problem).

RECCOMENDED REPLACEMENT RIBBON

To reload the cartridge I recommend Ricoch pancake ribbon.

This brand is slightly too large for the cartridge and I have to discard a few feet of it first to make it fit.

NEC pancake will work, but the ribbon is wider and tends to jam about half way through a reel. If this happens just cut it, discard the used portion and rethread as you would with an ADAM ribbon as described in the first example above.

There may be other brands of the right size but these two are readily available for $1.50, (or perhaps less if you can find them at a discount office supply, but I haven't been successful at doing so).

If, in whichever of the above cases, if you should find that the O-ring is streched, broken, or lost; you can get another at most hardware stores. Several sizes will work. I use R-65. I have not tried this with non-Coleco cartridges.

Happy printing!!!

Phil's PM's:

I would like to add one final, somewhat personal note.

There's the old adage "If it ain't broke don't fix it". In some cases this is true. But being in the maintenance repair field I have very strong feelings about preventive maintenance.

I take an hour a month to clean and lubricate my ADAM.

I use compressed air to remove any dust from inside the CPU and printer.

I clean the Data-drive and Disk-drive read/write heads.

I disconnect all cables and clean the connections.

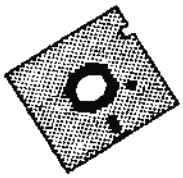
And every two or three month I remove the modem, expander and Data-drive cables and clean the connections. (It doesn't take much corrosion on these fittings to cause a problem). I use a foam tiped swab, rubbing alcohol and compressed air for this cleaning. I personally don't like a wet aerosol electronic cleaner.

If you use one of these products, make sure you follow the instructions.

Someone once said "An ounce of prevention is worth a pound of cure", I agree.

And please, don't eat or drink when using your ADAM. I can personally tell you what a glob of mustard can do to a keyboard.

Phil Kosowski



ADAM USER GROUP NEEDS

By Ron Mitchell

If you've been an ADAM owner for any length of time, you know that you're not likely to find ADAM software on the shelves at your local distributor. It hasn't been there for a while.

As an ADAM 'survivor' you've had to be a good deal more creative than most computer owners in finding out what is available and where to get it.

You've no doubt even tried to answer at least some of your personal computer needs by writing software of your own. (Sometimes that works well, and sometimes it does not!).

ENTER, THE ADAM USER GROUP

And, most promising of all, perhaps you've joined a user group and expanded your horizons by pooling your interests with those of other ADAMites in your area.

User groups form an important part of the ADAM landscape, and your participation as an ADAM owner is absolutely vital. This message may seem to be somewhat obvious, but it cannot be over emphasized. The plain fact is that without active and healthy user groups, there is no ADAM support. And when ADAM support ends, there will be no more ADAM!

WHAT CAN YOU DO?

As an individual, there are a number of things that you can do to ensure that your user group, (and in the final analysis your ADAM), remain active and healthy. All of these things really boil down to one phrase:

ACTIVE PARTICIPATION.

The plain fact is that, with group memberships all over dwindling, it is becoming increasingly important that the members who are left become more active than ever. Your group is quite likely to need:

Your financial Support!

Your ideas!

Your articles!

Your experiences with ADAM!

Your enthusiasm, interest and curiosity!

We all know that there are a lot of reasons for someone not participating.

Here are a few examples of the sorts of things that kill user groups.

"AH, WHY DO I NEED IT ANYWAY?"

Let's face it, not many of us are computer wizards. When we bought our ADAMs, it was the 'in thing' to buy a computer of some sort, even if it was only to provide the kids with an opportunity that we had never enjoyed, and one we felt that they needed to have.

We tend to rely very heavily on the experts to tell us the how and why of computers.

We may even limit our use of ADAM to one major area such as word processing, paying very little attention to the other things that the computer is capable of doing.

Reasoning in this way, it is very easy to come to the conclusion that membership in a user group is really not for us.

RE-CONSIDERING IT ALL OVER AGAIN!

Think again! Just ponder on this one thought! Next time you need a data pack or a printer ribbon, where are you going to get it?

WELL, I'M NOT INTERESTED IN WHAT THEY DISCUSS

Perhaps you've already joined a local AUG, but maybe you don't go to the meetings very often. It may well be that you don't find anything of interest going on there, or perhaps everything that comes up is way over your head.

In user groups this can be a real problem. The "old timer experts" tend to steer the discussion to their favourite topics, more or less ignoring the novices who are usually afraid of "displaying their ignorance", (as the novice might call it), in front of the group.

Think that over again too. Sure, anyone knows that it is easy to become intimidated; after all, those who attend have been doing so for a long time; and they all know each other, and they even speak a language often not entirely to your comprehension.

But even those "experts" will agree that the only "dumb" questions are the ones that don't get asked! Remember that you have as much right to introduce a topic for discussion as anyone else in the room.

LOOK FOR THOSE WHO ENJOY HELPING

And if you put your mind to thinking about how it would be if you were an "old timer expert"; and someone new came in seeding help, wouldn't you be anxious to assist?

Most of those who are presently considered to be the aforementioned "old timer experts" in your AUG, feel the same way. Some people are "born teachers" and we all have a bit of that in us.

Those older members often hunger for the opportunty to help someone with the information they have spent so long in acquiring. And week after week no one comes to the meetings needing help, so they discuss and sometimes re-argue the same old stuff over and over again.

And have you attended often enough to know how many times your club executive asks for input on meeting topics, projects, training subjects and the like?

How many times have you provided them with your ideas? (How many suggestions can one give if he does not even attend, or doesn't send notes, or in nowise communicates with the leadership)? Do you believe that your input is somehow less valuable than that of the person on the other side of the room?

As I keep on saying, "think again!" Your input is every bit as valuable, and your AUG will be less effective without it.

PARTICIPATION

Participation is the key. Pay your dues, go to meetings, be active in the discussions, let other members know what you've been doing with your ADAM and what kinds of experiences you've had. Write them up for the newsletter. Perhaps you have a Smartbasic program or two that should be in the club PD library rather than being hidden away gathering dust.

Get something going! Maybe you can think of an ADAM system expansion project that will get the members interested in working together to improve their systems at minimal cost, for example.

THE LEADERSHIP "TRIP", (OR IS IT "TRAP")?

The one thing AUG executives fear the most is that of being caught in the job of President, or Secretary or Program Co-ordinator or whatever, for the next 100 years with no possibility of relief.

This sort of thing can become lethal. Nobody wants to run, so the person who has the job can only hope for one of three events:

his own death

a move out of town

impeachment for poor performance

The latter one never happens. There are as many excuses for not running for office as there are people complaining about the current executive. That's usually the way it works, but you can change that if you wish to. In fact, you're the only one who can change it.

You've probably given a fair amount of thought to what you expect from your ADAM User Group. Have you spent as much time thinking about what you can contribute?

Ron Mitchell

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EDITOR NOTE:

We appreciate Ron's input. Without interest our computer willbecome completely useless to us. If we the owners keep up an interest, it will serve us well for many years. See the chapter START A NEW ADAM USER GROUP in this ASG for more ideas on how to keep an AUG moving ahead to the benefit of all of us. And share your ideas with ANN. We can pass it along to others too. Mel O.

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STARTING A NEW ADAM USER GROUP

by David Cobley

FOREWORD

This chapter is intended to assist those ADAMites who find themselves motivated to form a new ADAM user's group. The information, contained in the chapter, may be of benefit to existing user's groups, but it is primarily intended for those involved in forming new ones.

This chapter was developed principally from Barry Wilson's own files on the ADAM News Network discs.

The first part of this chapter originally appeared as STARTA_AUG (N), on the ADAM News Network disc, 9004ANN2, in April, 1990.

"HOW TO START A LOCAL AUG.", OR "DID YOUR MOMMA DROP YOU ON YOUR HEAD WHEN YOU WERE LITTLE?"

******** **GETTING STARTED, FINDING MEMBERS** ********

Assuming you really want to start a new local AUG and have the requirements, that is:

(1) own an ADAM;
(2) are independently wealthy;
(3) have hours & hours of free time; and
(4) you lack common sense, have rocks in your head, etc.

Here are some suggestions, [I am sure there are other ideas floating around, but these are some we have tried that seem to work (at least in theory)]:

First you need to get the names of other ADAM owners in your area.

MAILING LIST INFORMATION

Write to MIAD and A.I.M., the national newsletters. Ask them to send you a list of their subscribers in your area (Zip code, state, whatever you need to describe the area you hope to serve).

When you get the lists, write or call the individuals, and discuss the proposed AUG with them.

Try to enlist their support and membership. Remember however, that if they do not want to be part of an AUG, you cannot force it on them. An AUG may not be for everyone.

ADS IN PAPERS

Depending on your area of residence, there may be a local computer newsletter for computer users in general. (In St. Louis, for example, they have St. Louis Computing). Place an 'ad' or announcement in there, indicating that you are forming a new ADAM AUG, and asking local ADAM owners to contact you.

If you have a local paper, where items for sale or trade are listed, such as "Trading Times", etc., place an ad' indicating that you are selling, or that wish to buy ADAM items. Many of these local Buy, Sell & Trade papers, take non-commercial ad's for free, and some others only charge you based on what you actually buy or sell.

Since you are really only trying to meet other ADAM owners, and are not buying or selling, this should cost little or nothing.

EX-ADAM RETAIL DEALERS

Contact any local stores that have previously sold the ADAM. Leave them some flyers or other printed material about your AUG, and ask them to give these to anyone coming in asking about ADAM items.

(Many people will go back to where they bought their ADAM, expecting to find all kinds of ADAM items).

EX-ADAM REPAIR SHOPS

If your local area has a Honeywell or other repair facility, that fixes, (or used to fix), ADAMs, leave them some flyers to give out.

For both ex-retail stores and ex-repair facilities you will need to replace these fliers periodically. They are not going to go very far out of their way for you, but they do want to keep their old ADAM customers as happy as they can with as little effort on their own part as possible, and if you make

it easy enough for them, they will likely help.

Implementation of these ideas should give you a start finding other ADAMites in your area. But be prepared to do most of the initial work yourself. Later you may be lucky enough to find other owners with enough interest to help with the work load.

****** MOTIVATION TO JOIN THE NEW ADAM AUG ******

Once you have obtained a list of local ADAMites, you must come up with something that will motivate them to join your AUG.

THE BBS

One likely motivation possibility is the availability of a BBS, (or Bulletin Board System).

If there are enough ADAMites with modems in the area, you can set up a BBS for them. You will need a modem yourself, plus some means of storing the BBS programs,etc., a phone line you can use, and some BBS software.

An ADAM BBS system can either be one called an A-Net system, developed by Alan Neeley of ADAMLink of Utah, or a Y-DOS, (CP/M), System, similar to that developed by Big John Lingrel. John operated a BBS for many years under the company title of "Orphanware" in Akron, Ohio.

You will have to purchase the software, but once you have it, any of the other SYSOPS, (SYStem OPeratorS), who use he same BBSs system, will probably be willing to help you get your Board up and running. There is a great spirit of cooperation among the sysops and they share ideas, etc., quite freely.

The BBS could provide ADAM news, ADAM and AUG announcements, and allow for the exchange of private & public messages, etc. It is something to offer your members, or prospective members. They will need a modem, but that is not a huge investment!.

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EDITOR NOTE: Read the chapter on "TELECOMMUNICATIONS AND CURRENT BBS'S". Contact Alan Neeley for information on A-NET BBSs, and contact Bart Lynch or Rob Friedman for information on ANAN-NET BBSs. In general, addresses can be obtained by consulting the chapter of this book entitled "IMPORTANT NAMES AND ADDRESSES".

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THE NEWSLETTER

A newsletter is another thing you can offer members. Newsletters run the full gamut from a single-page announcement of forthcoming meetings, to a full 20-40 page monthly newsletter. We have several national and many other local newsletters, published by local AUGS, and many have a wide circulation.

The editors of most newsletters are generally quite helpful, and will share ideas, tips, etc. with you. Almost all of them, will allow you to re-print parts of their newsletters, as long as you clearly indicate the source of the material.

(Since most ADAM owners cannot afford to get all of the newsletters, the re-printed items are actually new to them).

Some newsletters have started simply as re-prints of parts of other newsletters, eventually working their way into the position of being able to produce at least some of their own original material.

Most of the editors will work with you, even to the point of allowing you take their newsletter, delete their local news, add your own local news, make adequate and appropriate acknowledgements concerning the source of the material, and publish it.

SOME PROSPECTIVE EDITORS, but not ALL, be forewarned!!! Some restrictions may apply! But newsletters are generally not prohibitively burdensome.

A newsletter is a good means of keeping in touch with members, and holding a group together. It does cost money for postage and printing however. In the beginning, you may have to put out much of this money yourself. Once you are more established, and have a dues base, that income will lessen your personal financial burden.

AND FURTHER, YOU ARE NOW ABLE TO USE THE RESOURCES OF A.N.N., (The ADAM News Network): which can make putting a newsletter together much easier and efficent, and raise the quality thereof considerably. (Contact ANN, see "IMPORTANT NAMES AND ADDRESS" in this book.)

(This second part of this article was also published by the ADAM News Network, in May 1990, under the filename START_AUG2 (B), on ANN Disc 9005ANN1. BDC.)

SALE OF PUBLIC DOMAIN, (PD), SOFTWARE

Remember, you must offer users as many good reasons to join your proposed group as possible. The BBS and newsletter are two excellent possibilities. PD (public domain, NON-copyrighted) software is another.

This software can be sold to members for the cost of the media (disk, tape), postage, if any, and a small profit to help pay the cost of the group providing the services etc.

Many of the AUGS, both national & local, have excellent PD libraries and may well be pleased to sell you some of them at a low price. Some may even give you a few to get you started.

But remember, while other groups may be willing to assist you, they have their own financial budget restraints and you cannot expect unlimited charity.

Since the volumes are PD, you are free to duplicate them and sell, or distribute as you wish, to your members.

REMEMBER, WITH COPYRIGHTED SOFTWARE, IT IS ILLEGAL TO SELL OR DISTRIBUTE COPIES, unless you are an authorized vendor!

The ADAM community at large considers the piracy of copyrighted software a serious offense. We already have an excellent computer, so the future of ADAM is really in its software. If good software authors cannot be rewarded for their many long hours of time and expended supplies, they will not write programs for the ADAM, and we will remain with the limited number of good programs that we have. ADAM software is not expensive! There is no excuse for stealing it!

THE ADAM PD LIBRARY

With PD material, you can create a PD library. This can be used as another motivation for members to join your AUG.

PD volumes come in all types. Games, utilities, graphics, music, etc.; and most other AUG's will be glad to help you get started.

Some AUGS offer the exchange of a library volume of their selection of PD programs to anyone donating a good PD program to the library.

Members are motivated to find and/or create good PD programs to donate, and the PD library grows at little cost to the AUG.

AUG PROJECTS

Group projects are another great reason for members to join your AUG. And what is a group project, you ask? As an example, the AWAUG (The Area Washington ADAM User's Group) has done some excellent group projects, such as producing memory expanders, 80 column terminals, etc., for their members.

You will need someone with some local technical ability in your group, but the level of expertise required diminishes radically when you select a project that has already been done satisfactorily by another AUG or group of AUGs.

Many other AUG's which do group projects, will be willing to share the instructions, details, etc. with you. With their plans and details, your group could also work on such projects.

It is also beneficial, if it can be arranged, for your group to **WORK WITH OTHER AUGS**. This may be work on ADAM promotion projects, or projects which help your own participating groups.

An added plus to this idea, is that by helping another AUG with something that they may be promoting, your group will likely learn a great deal; and also, when you need similar help, they will likely be available to help your group.

KEEP COMMUNICATION ON-GOING

Of course, the spread of ADAM information is a real drawing card to people considering joining your new ADAM AUG. Your other activities, such as the BBS, newsletter, etc., can serve to provide new ADAM information for your members.

BUT IT IS OF THE UTMOST IMPORTANCE FOR YOUR GROUP TO KEEP IN TOUCH WITH AS MANY OF THE OTHER AUGS AS POSSIBLE. Whether this is by exchanging newsletters with them, subscribing to their newsletters, or calling their BBS,etc.. A considerable amount of fresh information can be gained in this manner.

Encourage your members, (including yourself) to visit other BBSs regularly, and add good and new information to your BBS. Have them take a non-competitive attitude toward good articles and information and programs etc. Have them seek good from whatever source, and share good information with all who desire it.

SINCE COLECO WAS FINANCIALL FORCED TO DESERT US, WE ARE ALL IN THIS TOGETHER. WE MUST HELP EACH OTHER, AND WORK TOGETHER, TO KEEP ADAM AS GREAT AS IT'S POTENTIAL ALWAYS WAS.

****

EDITOR NOTE:
THE ADAM IS THE MOST ADVANCED 8 BYTE COMPUTER EVER BUILT. BUT ONLY COOPERATION WITH THE SHARING OF MUCH NEEDED INFORMATION, AND HONEST USE OF THE PROGRAMS AND HARDWARE, WILL ENCOURAGE WRITERS AND HARDWARE PRODUCERS TO KEEP US SUPPLIED WITH EVER INCREASINGLY USEFUL SOFTWARE AND HARDWARE.

**********THOSE THINGS ALONE WILL KEEP ADAM ALIVE!**********

(ANYTHING SHORT OF THAT WILL KILL IT!)
****

MONEY NEEDED, TAKERS AND GIVERS

Postage costs money. Printing costs money. Discs and tapes cost money.

IT COSTS MONEY TO RUN AN AUG

Now some people are simply takers and not givers, that is all that there is to it.

ADAMites are people, and therefore some ADAMites are takers and not givers. You must accept that as fact.

The fact that all men have "free agency" does not mean that all men will deal fairly with those about them when they make those "free" choices.

You cannot do it all! You cannot be a one man AUG!. If you try, eventually you will go broke, go crazy, or both.

In the beginning it is OK to expect to do most of the work and put out most of the money; but at some point you must recognize that you cannot force participation in an AUG on "takers". And, if they will not give unstintingly with their share, (at least their share); of time, money, etc., there is no point in trying to maintain their membership in the AUG, even if the loss means abandoning it completely.

You must let them know that what you are doing has value, that what you are offering has value. And if they will not pay for this value in some way, eventually you must no longer count them as members.

This is very difficult, as you will want members so badly, and you will want the AUG to grow in size so badly; that you may well overlook many things. But, at some point, it is not fair to those paying dues, doing the work, etc., to carry others who are not.

That is not to say that other groups will not do that. But you and your members must adopt a policy that is equitable to all concerned regarding people who cannot, for some reason; or will not, for whatever reason, renew their membership in a timely manner.

Operating costs are an ongoing problem for AUGs. If you are lucky, and interested, you may pick up some revenue advertising in your newsletter, from either local or national ADAM soppliers, from computer stores, etc. But don't count on it, I mean it when I say, "if you are lucky".

You must charge for the services of the group, whether it be dues, subscription to newsletter, for items you are re-selling, etc.

ADAM supplies are another good service offered by a user's group, as many ADAMites have no idea where to find replacement tapes, ribbons, etc. You can obtain these from various sources and keep some on hand for resale. You MUST make a small profit from these, to help pay some of the AUG's expenses.

And, if you decide to sell to non-members, you MUST charge them more than you would charge your members. There must be an incentive to join your AUG. These are just some of my thoughts on Starting an AUG.

Barry A. Wilson.

This concludes the 2 parts extracted and edited from the ANN disks.

USING ALL TALENT

Try to involve as many people as possible, in the effort of creating and maintaining the AUG.

Even if members have NO experience, NO knowledge, etc., they can still make phone calls, copy discs or tapes, transcribe programs or other articles for you, help assemble the newsletter, type mailing labels, etc., etc..

This is important to preserve your sanity; and even more important to know is that those organizations which are most successful are those which demand the most from their members. Let others feel involved, that they are doing their part, and that you appreciate their efforts.

There is very little that I can add to Barry's discussion on starting an ADAM User's group. From my own experience, I would say that once you have the ball rolling, it seems to gather a momentum of it's own.

In the case of our own group, Vancouver Island Senior ADAMphiles, which was started as a group to meet the needs of

retirees who own ADAM's; we are now at the point where word of mouth keeps us at a membership level that permits us to hold our meetings in a member's home, rather than rent accommodations.

When it came time for membership dues, at the start of 1991, our second year as a dues-paying organization, we lost three members. Or, should I say, three former members failed to renew their subscriptions.

Since that time we have signed up five new members without any form of advertising, other than that which may arise as part of a casual conversation, or as a result of previously published material. And we will likely keep on acquiring a small number of new members as time passes.

As the person that edits, publishes, copies and mails all of the group's newsletters, I am thankful that we are not expanding too rapidly. A reliable membership base is far more important to an AUG, than a relatively large, but not necessarily stable membership.

I read recently, in a copy of the March, 1985 issue of SYNTAX, (the official newsletter of the First Canadian ADAM Users' Group, based in Montreal, Quebec, Canada), that their membership grew to almost one thousand members in just two short months.

What a tremendous growth that must have been. And what an administrative nightmare!!! I understand that their final issue was circulated in January/February of 1987. Need I say more?

Before closing this chapter of the ASG, I take pleasure in providing a listing of the ADAM User Groups that are, as far as I know, presently active. Any errors, omissions etc., are mine, and I would appreciate receiving additions, corrections etc., from whatever source.

Send them to David Cobley, (see the chapter "IMPORTANT NAMES AND ADDRESSES" for necessary addresses)

ADAM USER'S GROUP LISTING

463 ADAM User's Group, (Dean Roades),
8522 Hohman Ave.
Munster, IN, USA, 46321 (219) 836-8646

Albany Area ADAM User's Group, (Ramen Griffin),
3 Robin Hood Rd.
Albany, NY, USA, 12203-5113 (518) 456-3293

Area Washington ADAM User's Group, (Tom Barrett),
6819 Rosemont Dr.
McLean, VA, USA, 22101

ADAM User Friendly Group, (Ron Mitchell),
Apt 1107, 210 Gloucester St.,
Ottawa, ON, Canada, K2P 2K4 (613) 230-9511

ADAM-Link of Utah, (Alan Neeley)
2337 South 600 East
Salt Lake City, UT, USA 84106 (801) 484-5114

ADAM'S HOUSE, (Terry Fowler)
Rt.2, Box 2756
Pearland, TX, USA 77581 (713) 482-5040

ADAM Family North, (Gerry St. Peter)
6508 34th St. SW
Calgary, AB, Canada, T3E 5N2 (403) 249-0837

Edmonton ADAM User's Group, (Jim Farrier)
39 Salisbury Ave.
St. Albert, AB, Canada, T8N 0N7.

Emerald Coast ADAM User's Group, (Faye Deere)
P.O.Box 4934
Fort Walton Beach, FL, USA, 32549-4934 (904) 244-1516

Gulf Coast ADAM User's Group, (Joe Quinn)
6665 Timbers Dr.
Mobile, AL, USA, 36695 (205) 639-1368

Inland Empire ADAM User's Group, (Tom Keene)
3141 E. Palmyra Ave.
Orange, CA, USA, 92669

Metro Orlando ADAM User's Group, (Pat Herrington)
1003 Oak Lane
Apopka, FL., USA, 32703, (407) 788-6396

Metro Toronto ADAM Group, (Richard Clee)
Box 165, 260 Adelaide St. East
Toronto, ON, Canada, M5A 1N0. (416) 783-0316

Omaha ADAM User's Group, (Norm Castro)
809 West 33rd. Ave.
Bellevue, NE, USA, 68005 (402) 291-4405

Puget Sound ADAM Newsnet, (Bob & Valerie Zimmerman)
22607 SE 22nd
Kent, WA, USA, 98042 (206) 886-1167

St. Louis ADAM User's Group, (Barry Wilson)
12967 Weatherfield Dr.
St. Louis, MO, USA, 63146 (314) 878-5220

Vancouver Island ADAM User's Group, (David Cobley)
862 Shorewood Dr.
Parksville, B.C. Canada, V9P 1S6 (604) 248-9567

(See also the lists of AUGs in the chapters "ADAM NEWSLETTERS, NEW AND OLD", and 'important names and addresses").

ADAM NEWSLETTERS, NEW AND OLD

by Norman R. Castro

ADAM lives on because of the people who care and contribute to this excellent "user friendly" system. In this first section I will list the newsletters that I know to be no longer active. I am thanking these devoted people that did help ADAM get off the ground and distribute important information about our ADAM.

** *COPIES* indicates that reduced size copies are immediately available for sale by the Chapter Editor, Norman R. Castro. These are made available for historical and fact-finding pursuits. If the reader is interested in obtaining any other non-active newsletters etc. for personal use, send two first class stamps only, and the name/s of the desired publications. I will answer you within a week. Please try the companies first and if they cannot help you, send me a copy of their answer. Thanks!

NAME: ADAM COMPUTING TODAY (ACT)
COMPANY: PHOENIX 2000, PO Box 1292, Kings Mtn, NC 28086
SUBSCRIPTIONS: $22 Year and $12 for six months. Published semimonthly.
EDITOR: Solomon Swift.
ISSUE/S: 1 Apr 90 only. 24 pages
** *COPIES*

NAME: ADAM CONNECTION
COMPANY: International Computing, PO Box 176, Patterson, NC 28661
SUBSCRIPTIONS: $10 per issue on DDP every 6 weeks
EDITOR: Not listed or mentioned
ISSUE/S: Nov 84, Feb 85, Jul 85 for a total of 3 issues

NAME: ADAM'S ALIVE
COMPANY: R&T SOFTWARE, 1010 Westminster, Garland, TX 75040
SUBSCRIPTIONS: $20 Year and $11 for six months down to $15 a year. Published monthly.
EDITOR: Ed Jenkins ** Assistant Editor: Trisha Jenkins
ISSUE/S: Dec 87 thru Mar/Apr 90 for a total of 13 issues.

NAME: THE ADAM'S APPLE
COMPANY: ADAM'S APPLE, 4835 Edsal Road, Cleveland, OH 44124
SUBSCRIPTIONS: $10. Published bi-monthly.
EDITOR: Charles Kolin
ISSUE/S: Dec 84? through Sep/Oct 85?
HELP: I only have issues #3 thru Vol 2 #1 for a total of 6 issues. If anyone else can contribute info it will be appreciated.

NAME: ADAMLAND NEWS (INTERNATIONAL from July 86 on)
COMPANY: ADAMLAND USERS GROUP, 795 Garfield, Lander, WY 82520
SUBSCRIPTIONS: $15 up to $20. Published somewhere about the first of each month, depending upon fishing season, small game hunting season, big game hunting season, hives, arthritis, heart problems, writer's cramp, rain, snow, drought, lack of sleep, lack of time, but not lack of ambition.
EDITOR: Buck A. Rogers
ISSUE/S: Nov 85 thru Mar 87? for a total of 13 issues.
ADDITIONAL INFO: His issues after Apr 86 do not contain any date or issue number. I let my subscription expire for lack of believeable, interesting & usefull informat042. But there is no such line number.

NAME: ADAM NEWS
COMPANY: Walters Software Company, Rd#4 Box 289-A Titusville PA 16354 (814) 827-3776
SUBSCRIPTIONS: Send a SASE or if you have purchased a Walters Software product in the last six months you will receive one automatically.
EDITOR: Not listed or mentioned
ISSUES/S: #1 and #2 only, received in 1989.

NAME: ADAM TECHICAL JOURNAL
COMPANY: Serendipity Productions, POBox 07592, Milwaukee, WI 53207
SUBSCRIPTIONS: $15.00 per year up to $18.00 published bi-monthly
EDITOR: not listed or mentioned.
ISSUES/S: Feb 85, Apr 85 and Jun 85 for a total of 3 issues
**COPIES*

NAME: ADAM USERS GROUP OF SAN DIEGO COUNTY
COMPANY: ADAM User's Group/SDC, 468 North 2nd St Suite 242, El Cajon, CA 92021
SUBSCRIPTIONS: None mentioned
EDITOR: Sue K.Askew
ISSUE/S: Jan/Feb 86 and Oct 86 (Vol 15) I have only 2 issues.
ADDITIONAL INFO: I received a postcard from them on 7 Oct 86 acknowledgine the newsletters that I had sent to them for trade. "We regret not responding in kind but have been without a publisher until Oct..."
HELP: If anyone else can contribute info, it will be appreciated.

NAME: ADAM-I-CHANGE
COMPANY: THE ADAM-I-CHANGE, 12863 Washburn, Wolcott, NY 14590
SUBSCRIPTIONS: Not listed or mentioned. Published bi-monthly.
EDITOR: Wade Rowley - then Robert Wright for the Jan/Feb 86 issue on at RPD#1, Box 528, Saco, ME 04072
ISSUE/S: Jan 85 thru Mar/Apr 86 for a total of 8 issues

NAME: ADAM MICROHACKERS
WRITE TO: Dave Kennedy NOTE: My letter was returned.
ADDRESS: 236 McKibben St., Suite 19, NY, NY, 11206
PHONE:
COSTS:

NAME: ADAMNet/National (ANIGH), The ANY NEWS IS GOOD NEWS NEWSLETTER
COMPANY: Reese Electronic Entertainment, PO Box 510, Uniontown, AR 72955
SUBSCRIPTIONS: $7.50 year for ADAMNet aaa) with no DEP FN

NAME: AUGment
COMPANY: ADAM USER'S GROUP, POBox P, Lynnbrook,NY 11563
SUBSCRIPTIONS: $12 year to $25. Published 6 times yearly
EDITOR: Al Gerson
ISSUE/S: NOV/DEC 84 through MAR/APR 87 plus a Special AUG bulletin (Apr 87) for a totalof 16 issues.
ADDITIONAL INFO: This is from an open letter from AUGment "...our membership has continued to diminish and we have been forced to discontinue the publication. We have not forgotten you, the ADAM user. We have made arrangements with the Word Processing User's Group (W/Pug) to continue the support of all ADAM users. They publish the enclosed newsletter, SCROLL. This publication covers all aspects of writing and word processing. It contains more pages and information than AUGment and includes articles, reviews and news regarding the ADAM computer.

NAME: AUSOCAL (info from IRAUG)
COMPANY: ADAM Users of Southern California
SUBSCRIPTIONS: unknown
EDITOR: Harvey Klein and Paul Schector
ISSUE/S: Published for about 3 years. 1st issue was May 85, then merged with IRAUG

NAME: CALIFORNIA ADAM USERS GROUP (CAUG) (info from IRAUG)
COMPANY: California ADAM Users Group
SUBSCRIPTIONS: unknown
EDITOR: Jono Smith ** Assistant Editor: Greg Noblette
ISSUE/S: July 85 was their only issue

NAME: COMPUTER DIGEST
COMPANY: CME Associates, 2231 Lake Ave. Eastlake, CO 80614
SUBSCRIPTIONS: No mentions of money. Published bi-monthly for the members of the CME Club (OAUC was a member)
EDITOR: R F Khoury
ISSUE/S: (Dec) 86 (additional info from gRAAUG (ADAM'S HOUSE) total of 3 issues. Last issue was Apr 86.

NAME: DENVER AUG
WRITE TO: JESSE THORNHILL II NOTE: My letter was returned.
ADDRESS: 1416 LIPAN ST., DENVER, CO 80204
PHONE:
COST:

NAME: EXPANDABLE COMPUTER NEWS (ECN)
COMPANY: Sage Enterprises, Rt 2, Box 211, Scrivner Rd., Russellville, MO 65074
SUBSCRIPTIONS: $12.00 year up to $15.00 for 6 issues. Published bi-monthly.
EDITOR Darrel R. Sage ** Associate: Shirley Sage
ISSUE/S: #1 Mar/Apr 84 thru #24 Jan/Feb 88 total of 24 issues
**COPPIES*

AME: GARDEN OF ADAM
COMPANY: ADAM Users of America, PO Box 2170, Huntington Beach, CA 92647
SUBSCRIPTIONS: $18 year
EDITOR: Taylor Borcroft ** Senior Editor East Coast: David Kennedy
ISSUE/S: Oct 84 only
** COPIES*

NAME: GREATER CINCINN AUG
WRITE TO: HAROLD OHNDORF JR
ADDRESS: 311 JONES HILL ROAD, HIGHLAND HTS., KY 41076
PHONE:
COSTS:

NAME: HIGH LIGHTS
COMPANY: Adam Users Group #1986, Amil Dillinger, 2226 Patterson, Joplin, MO 64804-6322
SUBSCRIPTIONS: free contributions accepted up to $30 year Published as information becomes available
EDITOR: Thomas Sawyer ** Asstistant Editor Nicky Nix, Brian Dillinger, and Mary Dillinger
ISSUE/S: Dec 86, Jun 87, Jul/Aug 87, Sep/Oct 87, and Nov/Dec 87 for a total of 5 issues

NAME: HOUSTON AUG
WRITE TO: TOM RUTAR
ADDRESS: 1805 14th AVENUE NORTH, TEXAS CITY, TX 77590
PHONE:
COST:

NAME: KANSAS ADAM USERS GROUP(S) (additional info IKAUG)
COMPANY: Kansas Adam Users Group(s), 1325 N. Meridian Apr 201, Wichita, KS 67203-4637
SUBSCRIPTIONS: $ Donations of First Class Postage. It was published monthly.
EDITOR: David R. Carmichael
ISSUE/S: Nov 85 thru Dec 86 I have 7 issues

NAME: NETWORKADAM NEWSINFO LETTER
COMPANY: ADAMzap Software, 17 Capstan Road, West Milford, NJ 07480-4816
SUBSCRIPTIONS: Free to anyone who sends in a Self-Addressed Stamped Envelope to ADAMzap. Published quarterly
EDITOR: R. Danz
ISSUE/S: Rcvd one on 18 Feb 89 and another on 25 Feb 91

NAME: NIBBLES & BITS
COMPANY: DIGITAL EXPRESS, 1203 Northwoods Drive, Kings Mountain, NC 28086
SUBSCRIPTIONS: $18 year for 12 issues up to $24 or 6 issues (6 months) for $12 up to $15.
EDITOR: Dr. Solomon Swift
ISSUE/S: #1 July 86 thru #29 Nov 89 for a total of 29 issues
** *COPIES*

NAME: OUTSIDER'S USERS' GROUP (OUG)
COMPANY: Outsiders User's Group, Donald L.Villiard, 122 Cedar Lane, Starkville, MS 39759
SUBSCRIPTIONS: $9 Annual plus completion of the enclosed "MEET OTHER OUG MEMBERS". Published every other month.
EDITOR: Donald L. Villiard
ISSUE/S: Sample issue Jan/Feb 86 thru May/Jun 87 for a total of 10 issues.
ADDITIONAL INFO: His last issue was only on DDp or Disk that you sent in to him for his newsletter. His idea is now working with A.N.N. ADAM NEWS NETWORK by Barry Wilson and Dean Roades.

NAME: PORTLAND ADAM BYTE BULLETIN
COMPANY: Portland ADAM users Group, PO Box 1081, Portland, OR 97217 c/o Craig Prerichs
SUBSCRIPTIONS: Not listed or mentioned. Published monthly
EDITOR: B.Shepperd
ISSUE/S: Sep 86 (Second Edition) + May 87 + Jun-July 87 as their last printed copy
ADDITIONAL INFO: Taken from their last issue "I have decided not to make copies of the newsletters. Instead, I will print it once & bring it to the meeting and let each of you read it. If you would like a copy of it, bring a disk or tape... "

NAME: SCROLL
COMPANY: Word/Processing User's Group, Inc., PO Box 144, Malverne, NY 11565
SUBSCRIPTIONS: $25 year. Published 6 times yearly
EDITOR: Al Gerson
ISSUE/S: May-Jun 87 (vol 2#3), thru Sep-Oct 87 (Vol 2#5) and beyond as I let my subscription expire.

NAME: SPRITE CHASER
COMPANY: #1 Adam Users' Group, PO Box 3761, Cherry Hill, NJ 08034
SUBSCRIPTIONS: Free to members of the #1 Adam Users' group. $15 up to $18.00 per year. Published quarterly.
EDITOR: Jay H Forman to Steve George to Gregory R. Daro
ISSUE/S: Oct 84 thru Jan 85 for a total of 12 issues

NAME: SYNTAX (additional info NYAG - Richard Clee)
COMPANY: First Canadian ADAM User's Group, PO Box 547, Victoria Station, Westmount PQ H32 2Y6, CANADA
SUBSCRIPTIONS: $20 bi-monthly
EDITOR: Ted Kwanchyna (J.D. Moore was an original principal)
ISSUE/S: Mar 85 (1.1) thru Jan/Feb 87 (2.6)

NAME: TRI-ANGLE AUG
WRITE TO: PAUL PAPPAS
ADDRESS: 2623-A YANCYVILLE ST., GREENSBORO, NC 27405-4407
PHONE:
COSTS:

NAME: VIDEOGAMING and COMPUTER NEWS (formerly HIGH LIGHTS NEWSLETTER)
COMPANY: M.A.D. Enterprises, PO Box 2484, Joplin, MO, 64803 $23.70 Published 6 times a year
EDITOR: Amic Dillinger Senior Editor Thomas Sawyer
ISSUE/S: #1 Mar/Apr 86, May/Jun 88 + Jun/July Bulletin

PUBLICATIONS

Here I will list most "general publication" magazines that had programs and or reviews for our ADAM computer system

NAME: BYTE
MONTH/YEAR/S: April 1984

NAME: COLECOVISION EXPERIENCE MAGAZINE
COMPANY: Coleco Industries, Inc., 99 Quaker Lane South, West Hartford, CT 06110
SUSSCRIPTIONS: $6 year to ColecoVision Video Club, PO Box 4825, Syosset, NY 11791
EDITOR: Lauren D' Alessandro
ISSUE/S: Spring 83, Fall 83, Winter 84 only
** *COPIES*

NAME: COMPUTER FUN (from Electronic Fun)
MONTH/YEAR/S: Apr 84 to May 84

NAME: COMPUTER GAMES
MONTH/YEAR/S: Dec/Jan 83 to Jan/Feb 85

NAME: COMPUTER ENTERTAINER
COMPANY: VIDEO TAKE-OUT, PO Box 4702, North Hollywood, CA 91607
SUBSCRIPTIONS: $24 up to $27 for 12 issues. Published monthly
EDITOR: none mentioned or listed
ISSUE/S: Apr? 82 thru July 90 for a total of 100 issues.
ADDITIONAL INFO: VIDEO TAKE-OUT accepts no advertising from any game manufacturer. The philosophy of this newsletter is to provide the reader with honest evaluations of game products on the market. It is our intention to act as an independent watchdog, providing critical commentary & analysis. The opinions are solely those of VIDEO TAKE-OUT and are not influenced by the manufacturers. To describe a game, we may use existing literature from the manufacturer, but that will have no bearing on the rating system." They covered ALL GAME/COMPUTER SYSTEMS and they issued me a check for the unused portion of my subscription without my asking for it I'm glad that I have 96 of those issues.

NAME: COMPUTER SHOPPER
MONTH/YEAR/S: Jun? 86 thru Dec 89

NAME: CREATIVE COMPUTING
MONTH/YEAR/S: Apr 84 issue

NAME: EASY HOME COMPUTER
MONTH/YEAR/S: Oct 83 issue

NAME: ELECTRONIC FUN (with COMPUTERS & GAMES) (to Computer Fun)
MONTH/YEAR/S: Nov 82 through May 84 17 issues

NAME: ELECTRONIC GAMES (to Computer Entertainer)
MONTH/YEAR/S: Jun 82 through Jul 85\ apprx 38 issues

NAME: ENTER
MONTH/YEAR/S: Oct 83 to May 85 THEN it was combined with 3-2-1- CONTACT

NAME: FAMILY COMPUTING MAGAZINE
MONTH/YEAR/S: Sep 83 thru Oct 87 when they dropped ADAM coverage Many thanks to Joey Latimer who started me off with his ADAM listings of programs. Total of 50 issues

NAME: JOYSTIK
MONTH/YEAR/S: Oct 82 thru Dec 83 for 18 issues

NAME: K POWER
MONTH/YEAR/S: Feb 84 thru Sep/Oct 84 THEN it was incorporated in MICROKIDS

NAME: MICROKIDS
MONTH/YEAR/S: Dec 83 thru July 84 for a total of 4 issues

NAME: MODERN ELECTRONICS
MONTH/YEAR/S: Dec 84

NAME: NATIONAL A-CLUB PO Box 15868, Chevy Chase, MD 20815
ADDITIONAL INFO: Manual by Tom Hogan $18. They introduced Modular Programing, Advanced String & File Manipulation lessons in N BASIC 5.21 ($35) for the ADAM computer. Approximately 10 to 12 lessons were received during 1986.

NAME: POPULAR SCIENCE
MONTH/YEAR/S: Sep 1983 issue

NAME: VIDEO & ARCADE GAMES
MONTH/YEAR/S: Spring 83 thru Fall 83

NAME: VIDEO & COMPUTER GAMING
MONTH/YEAR/S: Jan 84 thru Mar 84

NAME: VIDEO GAMES
MONTH/YEAR/S: Aug 82 thru Fall 84 for a total of 21 issues

NAME: VIDEO GAMES PLAYER
MONTH/YEAR/S: Aug/Sep 83 thru Oct/Nov 83

NAME: VIDEOGAMING
MONTH/YEAR/S: Apr 83 thru July 83

NAME: VIDEOGAMING ILLUSTRATED
MONTH/YEAR/S: Aug 82 thru Apr 83 for 5 issues THEN a name change to VideoGaming & Computer Games Illustrated issued from Jun 83 thru Mar 84 for a total of 9 issues. Grand total of 13 issues.

NAME: VULCAN'S COMPUTER BUYER'S GUIDE
MONTH/YEAR/S: Apr 90 thru Jan 90 THEN a name change to COMPUTER MONTHLY to present

ACTIVE ADAM CLUBS & NEWSLETTERS

The following active ADAM clubs are listed by states. Some information is not known such as costs, newsletter name etc; but there is enough information to allow the ADAM family to gain knowledge and to know that somebody out there is willing to help. Many thanks to MIAD for their listings, (by Jim Motini). Additional ADAM club information was provided by Pat Herrington, (Metro Orlando AUG), and by Richard Clee, (Metro Toronto ADAM Group, MTAG)... special thanks LONG LIVE ADAM

NOTE: When writing to the following AUGs please include at least 2 extra First Class Postage Stamps. Many would like a SASE, but I prefer only 2 stamps as I use 6 I 9 envelopes because of the many pages of samples etc. Even a large #10 envelope is so small that it tends to jam the post office machines. Thanks... Norman

NAME: GULF COAST AUG
WRITE TO: JOE QUINN
ADDRESS: 6665 TIMBERS DRIVE, MOBILE, AL 36695
PHONE: (205) 639-1368
COST:

NAME: AUG OF SAN DIEGO COUNTY
WRITE TO: SUE ASKEW
ADDRESS: 868 N 2nd ST., #242, EL CAJON, CA 92021
PHONE:
COST:

NAME: AUG SOCIAL
WRITE TO: HARVEY KLEIN
ADDRESS: 1736 SOUTH BEDFORD STREET, LOS ANGELES, CA 90035
PHONE:
COST:

NAME: BAY REGION ADAM INFO
WRITE TO: GEORGE HAVACH
ADDRESS: 550 27th ST., #2R2 SAN FRANCISCO, CA 94131
PHONE:
COST:

NAME: EAST BAY ADAM GROUP
WRITE TO: TOM OZRETICH
ADDRESS: 6037 SLOPEVIEW CT. CASTRO VALLEY, CA 94552
PHONE: (415) 886-2884
COST: No Newsletter

NAME: INLAND EMPIRE ADAM USERS GROUP (IEAUG)
WRITE TO: THOMAS KERNE
ADDRESS: 3141 EAST PALMYRA, ORANGE, CA 92669
PHONE:
COST: $18 year
ADDITIONAL INFO: CP/M is fully covered with step by step examples

NAME: AUG #305
WRITE TO: JOHN F. BUSBY II
ADDRESS: 6634 SW 41st ST., DAVIC, FL 33314
PHONE:
COST:

NAME: EMERALD COAST AUG
WRITE TO: FAYE DERRE
ADDRESS: PO Box 4934, FORT WALTON BEACH, FL 32549-4934
PHONE: (904) 244-1516
COST:

NAME: METRO ORLANDO AUG
WRITE TO: PAT HERRINGTON
ADDRESS: 1003 OAK LANE, APOKA, FL 32703
PHONE: (407) 788-6396
COST: $20 to members of the Metro Orlando ADAM User's Group

NAME: ADAM SUPPORT GROUP
WRITE TO: JOHN MOORE
ADDRESS: 1970 FISHER TRAIL NW, ATLANTA, GA 30345
PHONE:
COST:

NAME: HAWAII AUG
WRITE TO: MARC ACOSTA
ADDRESS: 1534 HOONIPO ST., PEARL CITY, HI 96782
PHONE:
COST:

NAME: MIAD
WRITE TO: LYLE MARSCHANG or JIM MOTINI
ADDRESS: PO Box 1317, LISLE, IL 60532
PHONE: (708) 961-3529
COST: $22 mailed 3rd Class, $29 mailed 1st Class
ADDITIONAL INFO: Huge PD for ADAM, DEALER for both Software and Hardware and an ADAM STORE CompuKINGDOM

NAME: 463 ADAM
WRITE TO: DEAN ROADES
ADDRESS: 8522 HORMAN AVENUE, MUNSTER, IN 46321
PHONE: (219) 836-8646
COST: $20 year

NAME: SLUG
WRITE TO:
ADDRESS: 6413 BRISCOE LN, LOUISVILLE, KY 40228
PHONE:
COST:

NAME: MAINE ADAM LIBRARY
WRITE TO: ROBERT E. SEBELIST
ADDRESS: PO BOX 85, WATERFORD, ME, 04088
PHONE: BBS/Voice (207) 583-2338
COSTS:
ADDITIONAL INFO: Robert has Public Domain Programs and is not at home much in the summertime as he and his wife take to the road

NAME: DOWNTOWN MINNEAPOLIS AUG
WRITE TO: TOM GILMORE
ADDRESS: 1424 W. 33rd AVE., MINNEAPOLIS, MN 55408
PHONE:
NAME: ADAM NEWS NETWORK (ANN)
WRITE TO: BARRY WILSON
ADDRESS: 12967 WEATHERFIELD, ST LOUIS, MO 63146
PHONE: (314) 878-5220
COSTS: $35 year with at least 2 full Disks each month w/prgms/news/pics/reviews/game directions etc.

NAME: SAINT LOUIS ADAM USERS GROUP
WRITE TO: BARRY WILSON
ADDRESS: 12967 WEATHERFIELD DR, ST. LOUIS, MO 63146
PHONE: (314) 878-5220
COSTS: $19 year

NAME: OMAHA ADAM USERS CLUB (OAUC)
WRITE TO: NORMAN R. CASTRO
ADDRESS: 809 WEST 33rd AVENUE, BELLEVUE, NE 68005
PHONE: (402) 291-4405
COSTS: $5 year for the Newsletter
ADDITIONAL INFO: This is the oldest active ADAM Newsletter, Club known. It was established on 11 July 1984 by Norman R. Castro

NAME: LONG ISLAND RESOURCE (LIAR)
WRITE TO: ROB FRIEDMAN
ADDRESS: 3814 OCEAN AVENUE T-2, EAST ROCKAWAY, NY, 11518
PSONE:
COSTS:

NAME: AAAUG
WRITE TO: JAMES GRIPPIS
ADDRESS: 3 ROBIN HOOD ROAD, ALBANY, NY 12203-5113
PHONE:
COSTS: $10 year

NAME: AKRON ADAM USERS
WRITE TO: ROB COLLINS
ADDRESS: 529 GRANDVIEW, BARBERTON, OH, 44203
PHONE:
COSTS:

NAME: LAKE ERIE ADAM USERS
WRITE TO: JOHN FLINGER
ADDRESS: 2110 W. 36th ST., LORAIN, OH 44503
PHONE:

NAME: ADAM INTERNATIONAL MEDIA (AIM) (gHAAUG)
WRITE TO: ADAM'S HOUSE
ADDRESS: 1829-1 COUNTY ROAD 130, ROUTE 2, Box 2756, PEARLAND, TX 77581-1503
PHONE: (713) 482-5040
COST: $20 year
ADDITIONAL INFO: Huge PD for ADAM, DEALER for both Software and Hardware and REPAIRS ADAMS, DISK DRIVES ETC

NAME: ADAM USER'S OF EL PASO
WRITE TO: DICK LEWIN
ADDRESS: 6308 FALLING STAR, EL PASO, TX 79912
PHONE:
COST:

NAME: SOUTHWEST AUG
WRITE TO: JEAN STONE
ADDRESS: 3301 MOBILE AVE, EL PASO, TX, 79912
PHONE:
COSTS:

NAME: ADAM INFORMANT (ADAM LINK of UTAH)
WRITE TO: ALAN ORELRY
ADDRESS: 2337 SOUTH 600 EAST, SALT LAKE CITY, UT 84106
PHONE: (801) 484-5114
COST: $20 year
ADDITIONAL INFO: DEALER for both Software and Hardware, some hardware repairs. BBS expert!

NAME: CENTRAL VIRGINIA AUG
WRITE TO: TOM KELLEY
ADDRESS: 3-B CHESTNUT GROVE, CHARLTESVILLE, VA 22936
PHONE:
COSTS:

NAME: ADAM WASHINGTON AREA UG (AWAUG)
WRITE TO: JAMES HOWARD
ADDRESS: 6541 VIRGINIA HILLS AVE., ALEXANDRIA, VA, 22310
PHONE: (703) 960-5315 + BBS (202) 561-2475
COSTS: $15.00 year

NAME: PUGET SOUND ADAM NEWSNET
WRITE TO: VALORIE ZIMMERMAN
ADDRESS: 22607 SR 322nd, KENT, WA 98042
PHONE: (206) 886-1167
COSTS: $5 year

Thats the list of Active ADAM clubs/newsletters that I know about in the United States. If you know of any more or of any corrections that should be done contact NORMAN R. CASTRO (See "IMPORTANT NAMES AND ADDRESSES" in this AUG)

CANADIAN

NAME: ADAM USER FRIENDLY GROUP
WRITE TO: ROB MITCHELL
ADDRESS: 210 GLOUCESTER ST., Apt 1107, OTTAWA, ONT., CANADA K2P-2K4
PHONE:
COST:

NAME: CALGARY ADAM'S FAMILY
WRITE TO: GERRY ST. PETER
ADDRESS: 6508 34th ST. SW, CALGARY, ALB., CANADA T3E-5N2
PHONE: (403) 249-8837
COST:

NAME: EDMONTON ADAM UG
WRITE TO: ARNOLD URBONAS
ADDRESS: 11720 UNIVERSITY AVE, EDMONTON, ALB CANADA T6G-1Z5
PHONE:
COSTS:

NAME: KEYSTONE ADAM USERS GROUP
WRITE TO: PAUL ELSHOFF
ADDRESS: 417 ADSUM DRIVE, WINNIPEG, MB., CANADA R2P-0W9
PHONE: (204) 633-5126
COST: Newsletter is free and is transferred to the user's media
ADDITIONAL INFO: This may be the oldest active ADAM club

NAME: LOYAL ADAM USERS of the GOLDEN HORSESHOE (LAUGH)
WRITE TO: GEORGE HARRIS c/o LAUGH
ADDRESS: PO Box 182, GRIMSBY, ONT. CANADA L3M-4G3
PHONE:
COST:

NAME: MAGnet AUG
WRITE TO: ERIC BRENNAN
ADDRESS: 888 TEMPLETON AVENUE, WINNIPEG, MAN., CANADA R2V-3B6

PHONE:
COSTS:

NAME: METRO TORONTO AUG (MTAG)
WRITE TO: RICHARD CLEE
ADDRESS: Box 165, 260 ADELAIDE STREET EAST, TORONTO, ONTARIO CANADA M5A-1N0
PHONE: (416) 783-0316
COST: Membership $25 year with bi-monthly newsletter

NAME: VANCOUVER AND THE ISLANDS SENIOR ADAM PHILIES (VISA)
WRITE TO: DAVID COBLEY
ADDRESS: 862 SHORERWOOD DRIVE, PARKSVILLE, BC., CANADA V9P-1S6
PHONE: (604) 248-9567
COST: Membership $20.00 year with 6 issues

FOREIGN

NAME: ADAM OWNERS & USER GROUP NEWSLETTER (AOUG)
WRITE TO: DENNIS RILEY NOTE: He has not answered my letter
ADDRESS: 10 OLD GEELONG ROAD, POINT LONSDALE, VIC 3225, AUSTRALIA

NAME: UNITED KINGDOM ADAM SUBSCRIBERS
WRITE TO: KEITH HARPER
ADDRESS: 33 HOMER ROAD, CROYDON, SURREY, ENGLAND CR0-7SB
PHONE: (from the USA) 001-44-81-654-2184
COST:
ADDITIONAL INFO: This group started in June 1986 and they currently have members in Belgium, Scotland, Spain, Wales and the USA. As far as he knows, this is the ONLY ADAM user group in the UK and perhaps all of Europe.

In May of 1988 they acquired ALL ADAM INVENTORY from TELEGAMES UK. Each US MONEY ORDER costs him ^5.00 ($9.00 US), so not many orders are sent to him from the US. However a VISA card goes a long way.

His bi-monthly newsletter, "THE UK ADAM SUBSCRIBERS JOPURNAL" is published within the first 3 weeks of every EVEN numbered month. The registration fee and first year's membership is $10.00 ($15.00) per year with 6 bi-monthly 26 to 34 page newsletter issues.

Well thats it for the list of active ADAM clubs that I have come across. If there are any more OR if there are any mistakes, please write and let me know so that corrections can be made promptly. This is the "ADAM NEWS LETTERS, NEW AND OLD" chapter editor signing off!!
(See "IMPORTANT NAMES AND ADDRESSES" in this ASG).

Norman R. Castro

EDITOR NOTE: ANN invites all ADAM user groups to register with them when they go into business, or out of business. In this way ANN can act as central information center for interested ADAMites. A list of pertinent information using the above format by Norman R. Castro would suffice.

ADAM BOOKS

by Rich Clee

(Biog note: Richard Clee, president of the Metro Toronto ADAM Group, has his graduate degree in library science).

NOTE:- The bibliographic form used in the following listing conforms to standard library practice; except that to save space and repetition the publication date, (either 1983 or 1984 in all but one or two cases), has been omitted. Place of publication has also been omitted as many of the small publishers involved have disappeared, and others have moved. All publishers are located in the United States, as all the bibliographies consulted indicated that no ADAM books had their original publication elsewhere, though a number of titles were published under licence by U.K. publishers under their own imprints.

It should be assumed that all ADAM books, except specialist individual titles, are out of print. They cannot be obtained in regular retail bookstores or ordered from the publishers. However, a number of major ADAM retailers, (e.g. M.W. Ruth, MIAD, etc.), still have remaining stocks of some titles. User group members also often have used copies they are willing to sell.

Abitoff, William. The basic ADAM, by William Abitoff and Gary Cornell. (Series 1-999). John Wiley & Sons. ISBN 0-471-88807-5.

Alden, Carole. Word processing with your Coleco ADAM. SYBEX. ISBN 0-89588-102-9.

Banse, Timothy P. Home applications and games for the Coleco ADAM. Version One Point Zero. ISBN 0-934523-01-0.

Bell, A.J. ADAM user's guide. By A.J. and K.Q. Bell. Brady Communications. ISBN 0-89303-300-6.

Benson, Ramsey J. The ADAM's companion. By Ramsey J. Benson and Jack B. Rochester. Avon Books. ISBN 0-380-87650-7.

Berg, Eric N. ADAM: the home computing system. By Eric N. Berg and Alan Smith. Banbury Books. ISBN 0-88693-066-9.

Blackadar, Thomas. The easy guide to your Coleco ADAM. SYBEX. ISBN 0-89588-181-0.

Cassidy, Pat. Kids, BASIC and the Coleco ADAM, by Pat Cassidy and Jim Close. Prentice-Hall. ISBN 0-13-515438-3.

Claflin, Edward B. Programming ADAM: home applications in the BASIC language. By Edward B. Claflin and John A. Heil. Banbury Books. ISBN 0-88693-034-0.

The Coleco ADAM user's encyclopedia. Book Company. ISBN 0-317-05836-X.

Dent, Arthur. The first book of ADAM the computer. TAB Books. ISBN 0-8306-0726-X.

Dustheimer, David. Coleco ADAM. By David Dustheimer and Ted Buchholz. (Tool Kit series). Howard W. Sams Company. ISBN 0-672-22312-0.

Goldstein, Larry Joel. ADAM: an introduction to the operating system, BASIC programming, and applications. Brady Communications. ISBN 0-89303-296-4.

Haskell, Richard E. Coleco ADAM BASIC. Prentice-Hall. ISBN 0-13-140450-4.

Hearn, Robert H. Mastering the Coleco ADAM. Tribeca Communications. ISBN 0-943392-44-6. (May have been withdrawn before publication).

Hinkle, Peter. Hacker's guide to ADAM, vols. 1 & 2. By Peter and Ben Hinkle. P.Hinkle. (117 Northview Rd., Ithaca, NY., 14850). No ISBN.

Hinkle, Peter. Information for ADAM explorers. Published by author. No ISBN.

Knight, Timothy Orr. Basic BASIC programs for the ADAM. TAB Books. ISBN 0-8306-0116-3.

Knight, Timothy Orr. Using and programming the ADAM including ready-to-run programs. TAB Books. ISBN 0-8306-0706-4.

Misstkowski, Stan. Getting the most from your Coleco ADAM. Osborne/McGraw-Hill. ISBN 0-88134-129-0. (Believed withdrawn before publication).

Miller, Deborah J. ADAM user's guide, by Deborah J. Miller

and Deborah Voosen. Brady Communications. ISBN 0-89303-388-6.

Miller, Deborah J. Fun with the ADAM: a kid's guide to writing BASIC programs. Brady Communications. ISBN 0-89303-459-2. (Believed withdrawn before publication).

Mullish, Henry. The Coleco ADAM, by Henry Mullish and Robert Weisenthal. Creative Computing. ISBN 0-916688-78-X.

Ostler, Mel. From basics to BASIC, a beginner text for new hackers. (Hacker's helper series, preparatory volume). Roadrunner (3217 Mesilla Hills Drive, Las Cruces, NM., 88005). No ISBN.

Ostler, Mel. Learning to draw with ADAM. (Hacker's helper series, v.3). Roadrunner. No ISBN.

Ostler, Mel. Learning to read with ADAM. (Hacker's helper series, v.1). Roadrunner. No ISBN.

Ostler, Mel. Learning to write with ADAM. (Hacker's helper series, v.2). Roadrunner. No ISBN.

Porter, Kent. Mastering the Colecovision ADAM. (Plume Computer Books series). New American Library. ISBN 0-452-25488-4.

Reyman, Joseph. How to use the Coleco ADAM. (Handy Guide series). Alfred Publishing. ISBN 0-88284-274-9.

Roth, Pamela J. The first book of ADAM: using and programming the Coleco ADAM. Que Corporation. ISBN 0-88022-063-5.

Roth, Pamela J. The second book of ADAM: using SmartWriter. Que Corporation. ISBN 0-88022-066-X.

Rugg, Tom. 32 BASIC programs for the Coleco ADAM. By Tom Rugg and Phil Feldman. dilithium press. ISBN 0-88056-141-6. (Disc or tape optionally included at extra cost).

Sawyer, Brian. The Coleco ADAM entertainer. Osborne/ McGraw-Hill. ISBN 0-88134-134-7.

Scharf, Peter. Learning together with ADAM. McGraw-Hill. ISBN 0-317-05645-X.

Searle, Bill. SmartBASIC for the ADAM. By Bill Searle and D. Jones. Brady Communications. ISBN 0-89303-846-6.

Softsync. Joy of BASIC for the ADAM, by Softsync and Gary West. Brady Communications. ISBN 0-89303-589-0.

Spear, Barbara. Word processing with your ADAM. TAB Books. ISBN 0-8306-1766-3.

Summers, Charles F. ADAM digital data pack format and duplication manual. LOF Communications (P.O. Box 587, York, PA. 17405-0587) No ISBN.

Sutphin, Susan. Programming the ADAM computer with ready-to-run progams. Prentice-Hall. ISBN not available.

Swadley, Richard. Using your Coleco ADAM: beginning BASIC and applications. By Richard Swadley and Joseph Hikert. Prentice-Hall. ISBN 0-13-937368-3. Datapack optional at extra cost.

Talcott Mountain Science Center. Discovering science on your ADAM, with 25 programs. TAD Books. ISBN 0-8306-8780-3.

Titus, Christopher. Coleco ADAM starter book, by Christopher and Jonathan Titus. Howard W. Sams Company. ISBN 0-672-22380-5.

Uston, Ken. Ken Uston's illustrated guide to the ADAM. (Illustrated Guides series). Prentice-Hall. ISBN 0-13-514647-I.

Weber Systems Incorporated. Coleco ADAM user's handbook. Ballantine Books. ISBN 0-345-31839-0.

Weber Systems Incorporated Staff. Coleco ADAM for students. Weber Systems. ISBN 0-938862-43-X.

Willis, Jerry. How to use the Coleco ADAM. dilithium press. ISBN 0-88056-149-1.

Willis, Jerry. Things to do with your Coleco ADAM computer, by Jerry Willis, Merl Miller, and Cleborne D. Maddux. New American Library. ISBN 0-451-13182-7.

Zochert, Donald. How to use the ADAM. Flip Track. ISBN 0-318-01283-0. Includes workbook and tape.

SEARCHING FOR ADAM BOOKS

NOTE:- The bibliographic form used in the following listing conforms to standard HOW TO OBTAIN ADAM BOOKS - NOW

It is recognized that it is one thing to know that a book exists, and quite another to lay your hands on it. The vast majority of all books ever published are out of print, which means that the publisher is sold out and has no reprint plans. Most bookstores have long since sold out any stock they had. So, how do yoe buy a copy of a book listed above?

First the good news: the Ostler titles are recent, (some are yet in the making), and can be ordered from the author, or bought from almost any ADAM retailer. Many retailers also have a good stock of the Winkle titles, especially the Hacker's Guide. Some of the larger retailers also have

remaining stock of one or two of the other, more popular titles. Look in their catalogs, or write and ask.

(See IMPORTANT NAMES AND ADDRESSES and the paid ad from ROADRUNNER PUBLICATIONS in this ASG).

Your second line of approach should be to go through your user group. (Not a member? Then surely you're not serious enough about the ADAM to want a book anyway?). Ask at group meetings. Often you will find a member selling an ADAM, or trading in used ADAMs, who can offer what you need. Ask the editor to put a note in the group newsletter. Remember many groups exchange newsletters, so your request will get wider circulation than you might at first think. Ask your newsletter editor for the latest ADAM News Network mailing list. All significant ADAM groups subscribe; write directly to them, asking them if any of their members have copies to offer. Get on your modem, and post your request as a message for circulation on an A-Net BBS.

If all these likely measures fail, look to the antiquarian book trade. You need to know that the used book market works at three levels. First is the totally disorganized, essentially garage sale operation, the top of this line being Goodwill. Even if they have your book they often won't know it, and it's a matter of purest chance, but if you root around persistently eventually you might get lucky - especially if other garage sale patrons know of your quest.

The second level is the used book store. These places tend to have a pretty miscellaneous jumble, but often organize it into at least broad categories. Their proprietors often have surprising memories, and their stock turns over quickly. A note left with an acute shopkeeper of this type may bring a phone call within reasonable time. It's worth a try, especially if you live near enough to a large city with a large number of such shops.

The third level are the antiquarian book shops. These are used book dealers who consider themselves a few cuts above the rest. They do not take in just any book. Most have one or a number of specialties - novels, first editions, history, biography, military history, hobbies, even computers. They advertise among themselves in a weekly journal called the Antiquarian Bookman. In it, they list the books their customers are asking for, and out-of-print titles they like to keep in their regular stock. These tend to be small, very personalized, long-established and often quite upscale businesses. They are not easy to find, and there may not be one near where you live.

How to find them? Ask your local library. If it's small, they will likely give you a strange look and fail to understand the question. But in large urban and academic libraries, they often find it necessary to replace, or increase their stock of, out-of-print books.

Find a librarian who knows what Antiquarian Bookman magazine is. Ask him (or her) where you can see a copy of Antiquarian Bookman Yearbook. This is an annual issue in which the dealers advertise, listing their specialties. Ask the name of either a computer specialist, or antiquarian generalist, bookstore. Visit if you can, write if you must, but state clearly what you want (author, title, edition if applicable, publisher, year of publication, ISBN. ISBN stands for International Standard Book Number and has ten digits divided into four groups, denoting language, publisher, book number in the publishers list, and a check number). Ask if the dealer is willing to include it in his want list in AB.

Don't talk price; there is no way of telling how much, or how little, your dealer will have to pay. When a copy is located, you'll be offered it at a price derived from what the source is asking. It may be very high, reasonable, or very low, but it won't be predictable. Be prepared to wait many weeks, check with the dealer no more than once a month, and if you ever expect to ask the dealer to chase a second title for you, don't balk at any reasonable price. Remember, the dealer may be paying through the nose to get it for you.

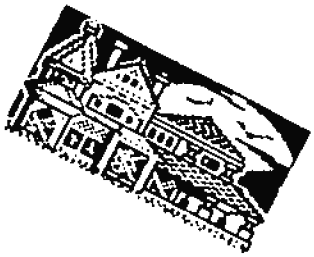
If you can't buy, you can always try to borrow. The fellow user group member who won't sell you his book may let you read it for a week or so.

The next logical stop is your local library branch. Look in the subject catalog under the headings ADAM (Computer) or, for some early titles, Coleco ADAM (Computer). In some loosely-cataloged collections, it may pay to try Microcomputers or even Minicomputers or even just Computers; in 1983 not all library catalogers knew the difference. Of course you should check the author and title files as well; author names are not subject to catalogers' vagaries and are the best guide to a specific book; it's just that related titles or possible alternatives won't be next to the card in the file. If you luck out in the branch, use the call number to search for it on the shelf. If it isn't there, ask the staff if it is stolen, withdrawn, or circulating. If the latter, put in a reserve and ask to be notified when it's back.

In the likeliest case, that your branch no longer has it, (or never did), ask if there is a regional union catalog. This allows you to search the catalogs of all cooperating libraries within a given area. If the book you want is within reasonable distance, go fetch it. If it is not, ask your branch to obtain it for you on interlibrary loan. The bigger the branch you are dealing with, the more likely they are to have a usefully large union catalog to search, and the more cooperative they are likely to be about obtaining an

interlibrary loan for you.

In the writer's home city, a case was encountered where it was necessary to search the entire combined recorded library holdings of Canada and the U.S. before the single existing copy of a desperately needed text could be located. The local library made the search and obtained the book for the local borrower. Not all institutions are as willing, and may request reimbursement of some fairly hefty line charges and postage. But if you are determined enough it can be done, and if a library is found willing to do it.



A warning: when you locate the book, make notes as you read it. Copyright is not affected by out-of-print status, and copying in some cases can be a criminal as well as a civil offence.

ADAM books are not always easy to come by. Some you will have to want very badly indeed to endure the tedious pursuit. But they can be had. All it takes is the will.

Richard Clee

Paramount Pictures

A D A M
THE FINAL FRONTIER

These are the issues of the news service ANN.
It's continuing mission,
to explore strange new hardware,
to seek out new sources and
new operating systems,
TO BOLDLY GO WHERE NO ONE HAS GONE BEFORE!

ADAM BOOKS REVIEWED

by Joe Alford

---, HOW TO USE THE COLECO ADAM, Alfred Publishing

Abicoff, William, and Cornell, Gary, THE BASIC ADAM, John Wiley Press

Bell, A. J., and Bell, K. O., ADAM USER'S GUIDE, Robert J. Brady Co.

Benson, Ramsey J., and Rochester, Jack B., ADAM'S COMPANION, Avon Books

Berg, Eric, and Smith, Alan, UNDERSTANDING ADAM, Banbury Books

Berg, Eric N., and Smith, Alan, THE HOME COMPUTING SYSTEM, Banbury Books, Inc.

Blackadar, Thomas, THE EASY GUIDE TO YOUR COLECO ADAM, Sybex Inc.

Cassidy, Pat, and Close, Jim, KIDS, BASIC, AND THE COLECO ADAM, Prentice-Hall

Claflin, Edward B., and Neil, John A., PROGRAMMING ADAM: HOME APPLICATIONS FOR THE BASIC LANGUAGE, Banbury Books

Dent, THE FIRST BOOK OF ADAM THE COMPUTER, TAB Books, Inc.

Erickson, Jeffren, and Richard, Susan, HEY, LET'S PLAY WITH THE ADAM!, Banbury Books, Inc., Children's Book, 4-6.

Falkoff, Bernard, CAN I PLAY WITH THE COMPUTER, TOO?, Banbury Books, Inc., Coleco ADAM, Preschool

Goldstein, Larry Joel, ADAM: AN INTRODUCTION TO THE OPERATING SYSTEM, BASIC PROGRAMMING & APPLICATION, Robert J. Brady Co.

Knight, Timothy Orr, BASIC BASIC PROGRAMS FOR THE ADAM, TAB Books, Inc.

Knight, Timothy Orr, USING AND PROGRAMMING THE ADAM INCLUDING READY-TO-RUN PROGRAMS, TAB Books, Inc.

Miller, D., and Voosen, D., ADAM USER'S GUIDE, Prentice Hall

Mortimer, Eugene D., ADAM SMARTWRITER WORD PROCESSING USER'S GUIDE, Prentice-Hall

Pellino, John, DISCOVERING SCIENCE ON YOUR ADAM WITH 25 PROGRAMS

Porter, Kent, MASTERING THE COLECO ADAM, New American Library

Roth, Pamela, THE FIRST BOOK OF ADAM: USING AND PROGRAMMING THE COLECO ADAM, QUE Corporation, 7999 Knue Rd Ste 202, Indianapolis, IN 46250

Roth, Pamela J., THE SECOND BOOK OF ADAM: USING SMARTWRITER, QUE Corporation

Rugg, Tom, and Feldman, Phil, THIRTY-TWO BASIC PROGRAMS FOR THE COLECO ADAM, Dilithium Press

Sawyer, Brian, THE COLECO ADAM ENTERTAINER, Osborne/McGraw Hill

Scharf, Peter, LEARNING TOGETHER WITH ADAM, McGraw-Hill

Searle, Bill, and Jones, Donna, SMARTBASIC FOR THE ADAM, Robert J. Brady Co

Spear, Barbara, WORD PROCESSING WITH YOUR ADAM, TAB Books, Inc.

Sutphin, Susan, PROGRAMMING THE ADAM COMPUTER WITH READY TO RUN PROGRAMS, Prentice Hall

Swadley, Richard, and Wickert, Joseph, USING YOUR COLECO ADAM: BEGINNING BASIC AND APPLICATIONS, Prentice-Hall

Talcott Mountain Science Center, DISCOVERING SCIENCE ON YOUR ADAM WITH 25 PROGRAMS, TAB Books, Inc.

West, Gary, JOY OF BASIC FOR THE ADAM, Robert J. Brady Co.

Willis, Jerry, HOW TO USE THE COLECO ADAM, Dilithium Press

Willis, Jerry, Miller, M., and Maddux, C., THINGS TO DO WITH YOUR COLECO ADAM COMPUTER, New American Library

Wolenik, Robert, THE PRACTICAL ADAM, A FAMILY GUIDEBOOK, Prentice-Hall

WSI Staff Weber Systems, Inc., COLECO ADAM USER'S HANDBOOK, Weber Systems Incorporated

William Abikoff & Gary Cornell, THE BASIC ADAM: A SELF-TEACHING GUIDE, John Wiley & Sons, Inc., New York, 1984.

A test program for TV overscan, an annotated color display, a paintbrush program, a memory dump program, a shape generator, a music program, and many other useful programs. A complete discussion of all commands. Many Apple/ADAM comparisons. BASIC is similar, but machine language is different because the two machines use different chips.

A discussion of the problems caused by base-2 arithmetic. Some examples: INT(3.00)=2 according to ADAM. Another example: if a%=6 and b%=4 then a%/b%=1.5, BUT if c%=a%/b% then c%=1.

A chapter on useful subroutines:

1) Find the larger of 2 numbers
2) Enter the coefficients of polynomials
3) Polynomial evaluation subroutine
4) Centering
5) Formatting (Avoids splitting word at line end)
6) Boldface
7) Word count and word search
8) Lower case to upper case conversion
9) Sorting subroutine that ignores upper/lower case

Many interesting HGR programs.

Lots of file-handling tips. STOP closes files. END does not. Nor does CNTL-C. Error conditions that abend the program close files, but ONERROR_GOTO does not. GET can fool up Operating System Commands because the cursor must be in column 1 and GET can leave it elsewhere. TRACE blocks input from a pack.

A list of error codes. The codes are the same as AppleSoft BASIC, but ADAM's messages are more descriptive.

This is one of the best books I have seen for the ADAM. I asked the library to get it for me twice from Pennsylvania.

Carole J. Alden, WORD PROCESSING WITH YOUR COLECO ADAM, Sybex, Berkeley, CA, 1984.

Use ESC/WP to abort a delete command. COLECO WP manual suggests UNDO, but this causes loss of text at the end of the roller.

ADAM accepts carriage return after backspacing only if you add a character.

This is a very limited book. What it attempts to do, it does well. It doesn't attempt much.

A. J. Bell & R. Q. Bell, ADAM USER'S GUIDE, Brady Communications Company, Inc., Bowie, Md 20715 (A Prentice-Hall Publishing Company), 1984.

Most of my notes for this book are from a list of computer terms.

The book gives 7 reasons for OUT of MEMORY error:1) No more RAM available
2) Too many variables
3) More than 24 nested GOSUB levels
4) More than 10 nested FOR loops
5) More than 36 nested levels of parentheses
6) LOMEM: set too high or too low
7) HIMEM: set too high

When you first load SmartBASIC you cannot use addresses > 54160

Ramsey J. Benson and Jack B. Rochester, ADAM'S COMPANION, Avon Books, New York, 1984.

Lots of history and general stuff in this one.

Chapter Five writes a calculator program from design through coding with comments.

This book is big on using SmartWriter to combine two BASIC programs. Programs must not have over-lapping line numbers. Combine in SmartWriter and save. Load BASIC, load the combined program and save.

PICMAKER program designed using top-down programming with stubs. SmartKeys are programmed. Letter Chaser, Music Maker, Mailing Label have extensive technical discussions.

Appendix A is a listing of ASCII character codes. This is not as complete as some others.

Appendix B has the command and function summary. This section is filled with sample programs. Use ABS as a switch toggle: sw%=ABS(sw%-1):REM 1=on, 0=off

Appendix C is an annotated list of ADAM books and magazines.

Appendix D is a discussion of shape table creation, including a program to give the numbers, but no full-function shape table manipulator.

Appendix E discusses how to start a computer club.

This is an excellent book.

Thomas Blackadar, THE EASY GUIDE TO YOUR COLECO ADAM, Sybex, Inc., Berkeley, 1984.

A complete book, from set-up through programming, this one is not very detailed on anything. It cautions that there have been problems with ADAM and suggests a 24-hour burn-in with the tv off to avoid phosphor damage. It says both word-processor and BASIC have bugs.

It also makes some suggestions about how to get around some limitations in ADAM. Search for xyz, for example, to get to the end of a document.

Pat Cassidy & Jim Close, KIDS, BASIC & THE COLECO ADAM (Adapted by Stephen Gray from BASIC COMPUTER PROGRAMMING FOR KIDS), Prentice-Hall Inc., Englewood Cliffs, NJ, 1983.

An unsatisfying book. Too complicated for kids, much too simple for adults. It doesn't teach you to really DO anything.

There is a lot of history that adults would find interesting, but a dearth of programs. There is a discussion of binary code and why computers use it, several chapters on flowcharting and documentation. And this for a program on how to write your name 100 times. Chapters on functions, sorting, arrays, and graphics. Even a chapter on why computers cannot deal with extremely large and extremely small numbers. But nothing to DO with any of this. A bad

book.

Edward S. Clafin and John A. Heil, PROGRAMMING ADAM, HOME APPLICATIONS IN THE BASIC LANGUAGE, Banbury Books, Inc., 353 West Lancaster Avenue, Wayne, PA 19087, 1984.

This is a very thorough explanation fo how to write a program. It explains a few concepts in each chapter and builds as it goes.

There are also programming tips, including very thorough discussions on how to debug a program and on how to check input so a user finger-fumble doesn't crash your program. There is a complete list of ASCI codes.

Larry Joel Goldstein, THE ADAM HOME COMPUTER: AN INTRODUCTION TO SMARTBASIC AND APPLICATIONS, Bradley Communications Company, Inc., Bowie, MD 20715.

This is an excellent introduction to the ADAM and to programming in general. It tends to slide over some of the very basic points, assuming that the user has read the manual that comes with the computer. The book is full of tips for making programming less painful: flowcharting, indentation, commenting.

On debugging: STOP can be used to halt execution of a program. The variables can be checked in immediate mode. If you change the program code, then you cannot continue with CONT.

A roulette program introduces random functions.

A bubble sort routine, how to allign decimals, and much more.

Timothy Orr Knight, BASIC BASIC PROGRAMS FOR THE ADAM, TAB Books, Blue Ridge Summit, PA 17214, 1984.

Programs by Darren LaBatt are very basic, with bugs. The explanations are very good, however. Each program has an introduction, then the code, then an annotated list of variables, then an explanation of what each block of code does. There is also a picture of the output.

Most of the programs are BLACK BOX programs: Put a number (or word) in and its mate comes out. State capitals is an example. There is also a drawing program, a graph program, Simon Says, and Blackjack.

Timothy Orr Knight, USING AND PROGRAMMING THE ADAM INCLUDING READY-TO-RUN PROGRAMS, TAB Books, Inc., Blue Ridge Summit, PA 17214, 1984.

This is a basic handbook on the ADAM computer. It describes the keywords and gives four examples of very simple programs.

John Pellino, DISCOVERING SCIENCE ON YOUR ADAM WITH 25 PROGRAMS, TAB BOOKS, Blue Ridge Summit, PA 17214, 1984.

The programs are not very impressive, especially since they are full of bugs. The book itself, however, is a humorous and non-threatening introduction to astronomy, geology, biology, math, and physics for children. The rock identification program and the height finder (using trig) encourage experimentation with science.

Kent Porter, MASTERING THE COLECO ADAM, New American Library, New York, 1984.

Very light reading, but there are a few things here that I've seen nowhere else. Porter has a tendency toward BLACK BOX programming.

The graphics chapter has an interesting section on adjusting for the horizontal vrs vertical distortion. There is also a good discussion of color bleeding and what can be done about it.

Pamela J. Roth, THE FIRST BOOK OF ADAM: USING AND PROGRAMMING THE COLECO ADAM, Que Corporation, Indianapolis, 1984.

Lots of useful information, from hardware modifications to programming routines.

To pause and clear the screen:

```
10 Print " Press any key to continue";
20 Get a$
30 HOME
```

SmartBASIC looks at the first, second, and last character of a variable name. That's why n, n%, and n$ are different.

Tom Rugg and Phil Feldman, 32 BASIC PROGRAMS FOR THE COLECO ADAM COMPUTER, dilithium Press, Beaverton, Oregon, 1984.

Application Programs: Biorhythm, Checkbook, Decide, Loan, Mileage, Quest/Exam.

Educational Programs: Arithmetic, Flashcard, Metric, Numbers, Tachist, Vocab

Game Programs: Decode, Groan, Jot, Obstacle, Roadrace, Wari.

Graphics Display Programs: Kaleido, Sparkle, Squares, Balloons.

Mathematics Programs: Curve, Diffeqn, Graph, Simeqn, Stats.

Miscellaneous Programs: Birthday, Pi, Powers, Pythag.

The book has massive external documentation for each program. There is a discussion of the program followed by several illustrations of screen displays and the program listing. There is a list of easy changes, a list of the main routines, a list of the main variables, and suggested projects.

There is no internal documentation in any program. Variable names are single-letter and often obscure. There is no concept of structured programming: GOSUB and GOTO are unbelievably overworked. The programs are BASIC and basic.

The book is expertly designed. The programs are poorly written. I got the book twice from the library in South Bend. It is definitely worth the trouble. This is one of the best books for the ADAM.

Peter Scharf, LEARNING TOGETHER WITH ADAM, McGraw-Hill, New York, 1985.

This is an extremely general book, the story of one family's adventuring with ADAM. They bought it so Scharf could write a book. Everyone enjoyed it.

Very general chapters on SmartWriter, SmartBASIC. Somewhat more on SmartLOGO, about which Scharf raves.

Half the book is given over to Appendices. Appendix II is a set of reviews of The Best Educational Software for ADAM.

Bill Searle and Donna Jones, SMARTBASIC FOR THE ADAM, Prentice-Hall, Bowie, MD 20715, 1984.

This is an excellent mid-level book. It does not attempt to cover everything. What it does cover it explains very well. There are a lot of nice programming tips. The usual conversion programs and drill programs are included.

Especially nice are the Common Problems sections that tell the most common mistakes and what to do about them.

A quick white line: INVERSE: PRINT TAB(30);" ":NORMAL.

Beep: FOR x=1 to 5:print chr$(7);:NEXT:PRINT:REM last PRINT shuts off semicolon

Barbara Spear, WORD PROCESSING WITH YOUR ADAM, TAB Books, Inc., Blue Ridge Summit, PA, 1984.

Barbara Spear is a technical writer for Coleco Industries. She is the editor of Coleco's NEW, REVISED ADAM SmartBASIC PROGRAMMING MANUAL shipped with each ADAM.

This is a style book, a list of forms for creating reports, letters, notes, outlines, etc., using the ADAM. Except for the information that the joystick can be used instead of the arrow keys to page through a document in SmartWriter, this book is not particularly useful as a study book for ADAM.

Susan Sutphin, PROGRAMMING THE ADAM COMPUTER WITH READY-TO-RUN PROGRAMS, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1985.

A brief explanation of the instruction set is followed by some fairly complex programs. The programs contain a common randomizing routine so that the same program is different each time it is run and no routine is repeated.

The programs for younger children use Smiley-face Frowny-face rewards and print certificates.

All programs have line-by-line explanations of the code.

Weber Systems Inc. Staff, COLECO ADAM USER'S HANDBOOK, Ballantine Books, New York, 1984

Full of interesting bits of information. ADAM's main microprocessor is a Z80A. There are four 6801 microprocessors to run the tape drive, the keyboard, the printer, and the fourth to connect the others to the Z80A. The Z80A is an 8-bit microprocessor capable of addressing 64K of memory. ADAM's other 16k is reserved for graphics. Some information is a bit exaggerated. "ADAM's digital data pack is faster than ordinary casette players, and is almost as fast as a floppy disk. Almost any AppleSoft program can be entered into SmartBASIC and runs without modification." You have to really push the meaning of the word "almost" to make those statements true.

In other places it is more realistic: "The Coleco is outstanding at producing stationary screen images... [but]... lacks the hardware to smoothly move images across the screen. This limitation is apparent when the movement of a large object is attempted."

Jerry Willis, HOW TO USE THE COLECO ADAM, dilithium Press, Beaverton, Oregon, 1984.

This book contains a nice history of the ADAM, explaining why is has not been a success despite being a good machine. It has a lot of technical information on both hardware and software.

Jerry Willis, Merl Miller, and Cleborne D. Maddux, THINGS TO DO WITH YOUR COLECO ADAM COMPUTER, New American Library, New York, 1983.

Every chapter of this book contains reviews of representative programs that will run on the ADAM. It is useful as a summary of what is available.

Chapters on home computers, ADAM as a teaching machine, word processing, home finance, telecommunications, business, languages, peripherals.

Joe Alford

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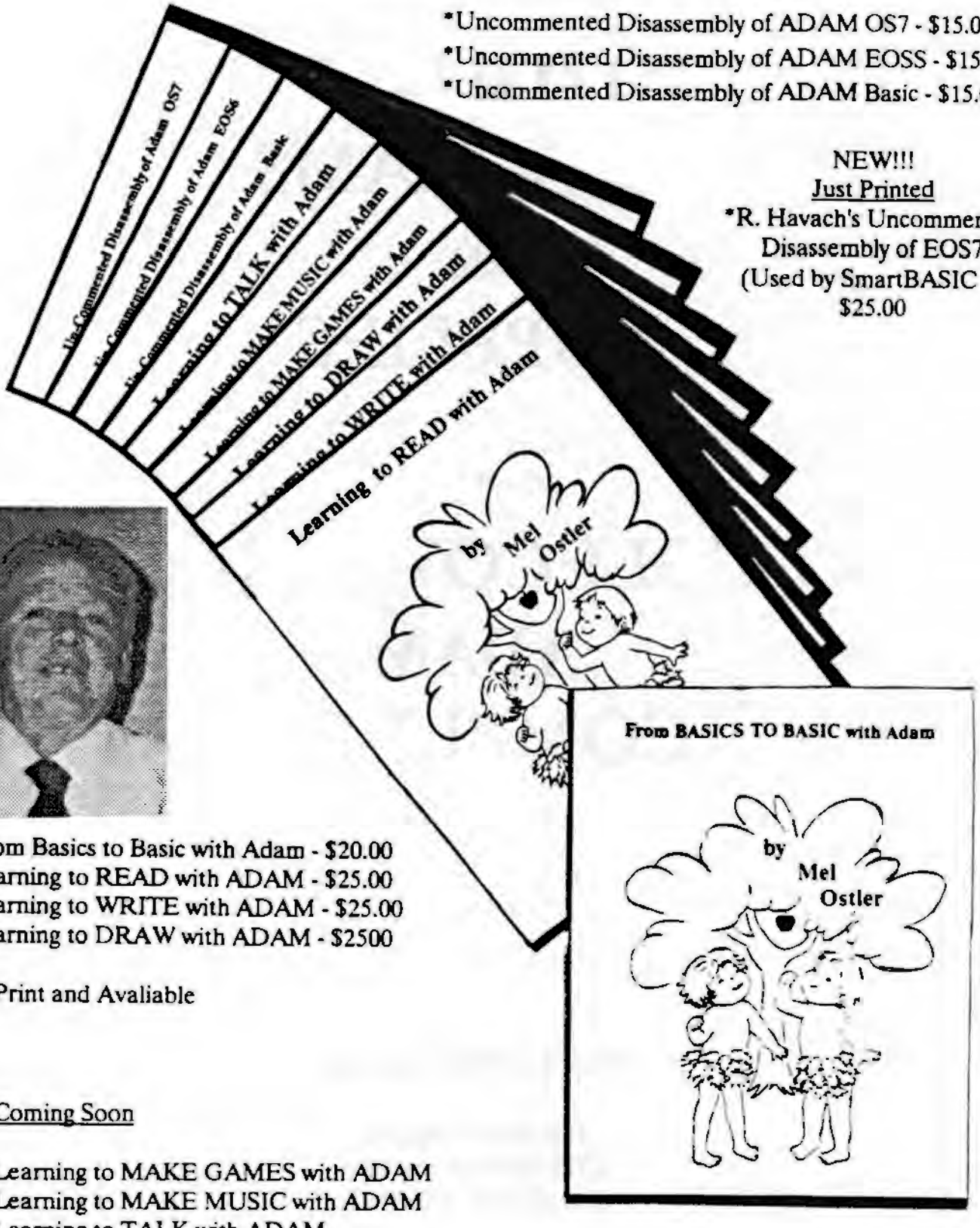

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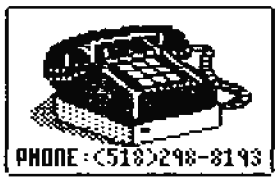

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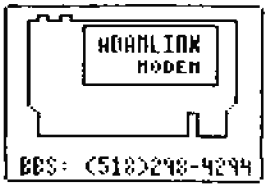

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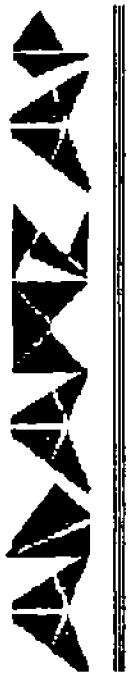

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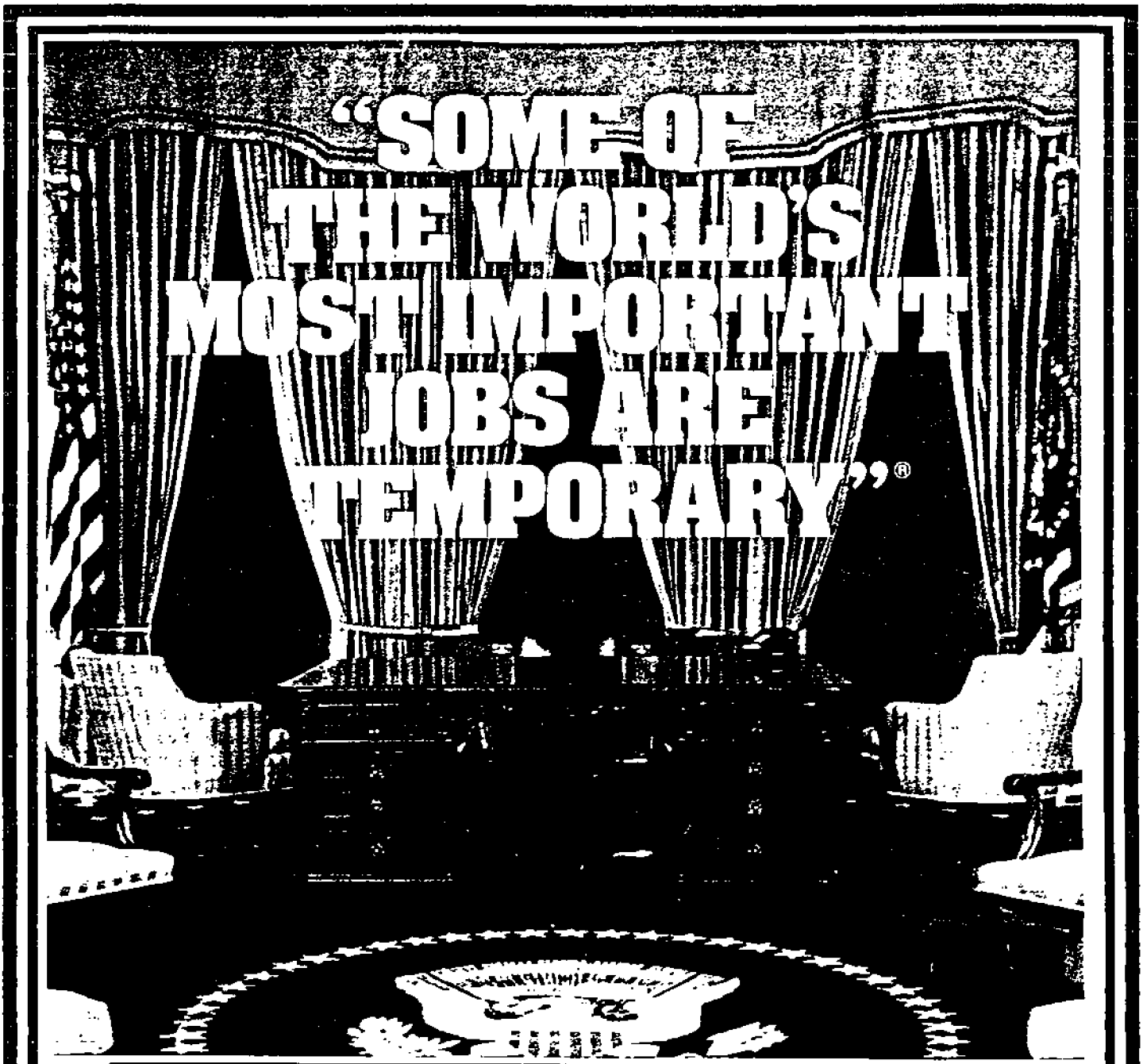

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GREETINGS FROM A.N.N. THE ADAM NEWS NETWORK

This ADAM SURVIVAL GUIDE was created as a joint effort of many ADAM owners for the sole purpose of making the ADAM FAMILY COMPUTER more useful to all who are privileged to own one. The work was organized and directed by the A.N.N.

The various ADAM User Groups throughout Canada, the United States, and Europe are, have been, and will continue to be the mainstay of ADAM owner support. They do a wonderful work of helping us all, whenever we the ADAM owners have problems.

It is largely through the encouragement and support of the ADAM User Groups that new software has been adapted, or written for the ADAM. It is largely through their encouragement and support that new hardware has been, and continues to be developed.

A.N.N., an unpaid group of ADAM owner volunteers, was organized for the purpose of helping the local ADAM User Groups do a better job at keeping their members well informed. The ADAM User Groups in turn have provided the support necessary to make A.N.N. a success, and all ADAM owners have benefitted.

This book, is a visual demonstration of how well that mutual support system has worked. Herein you will find information on the most basic of ADAM functions, and you will, at the other extreme, find information about the most contemporary hardware available, or being designed, for the ADAM.

We hope you enjoy this book, and if you don't presently belong to an ADAM User Group, we hope that you will take advantage of the benefits of so belonging, and find one to your liking, and join it and help it move ADAM even farther ahead. We will, of natural course move with it!

****
* So you can see how the cohesiveness of ADAM owners helps them *
* keep one another informed, we are offering to the purchaser of *
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We are personally grateful for those who have so willingly and unstintingly given of their time and resources to make the "ADAM SURVIVAL GUIDE" become a reality. They are great men and women. They are helpful and very understanding. All in all, we the co-editors have thoroughly enjoyed working with them.

And not all of the hard workers have their names in this book as authors editors etc. For example Bob Blair was always eager to do wordprocessor conversions and saved the co-editors a lot of time with his work. Rob Friedman was there to help with T-DOS information and whatever else he could do, as he always is in the shared position he holds with Tim Nunes as ADAM resentatives on COmpuServe. Jim Duffy assisted tremendously with his shipping of files whenever and to whomever it was necessary. And there are many others who have helped greatly in capacities too numerous to mention. We are thankful to them all, for making the ASG such a great book.

Co-Editors

Barry Wilson

and

Mel Ostler